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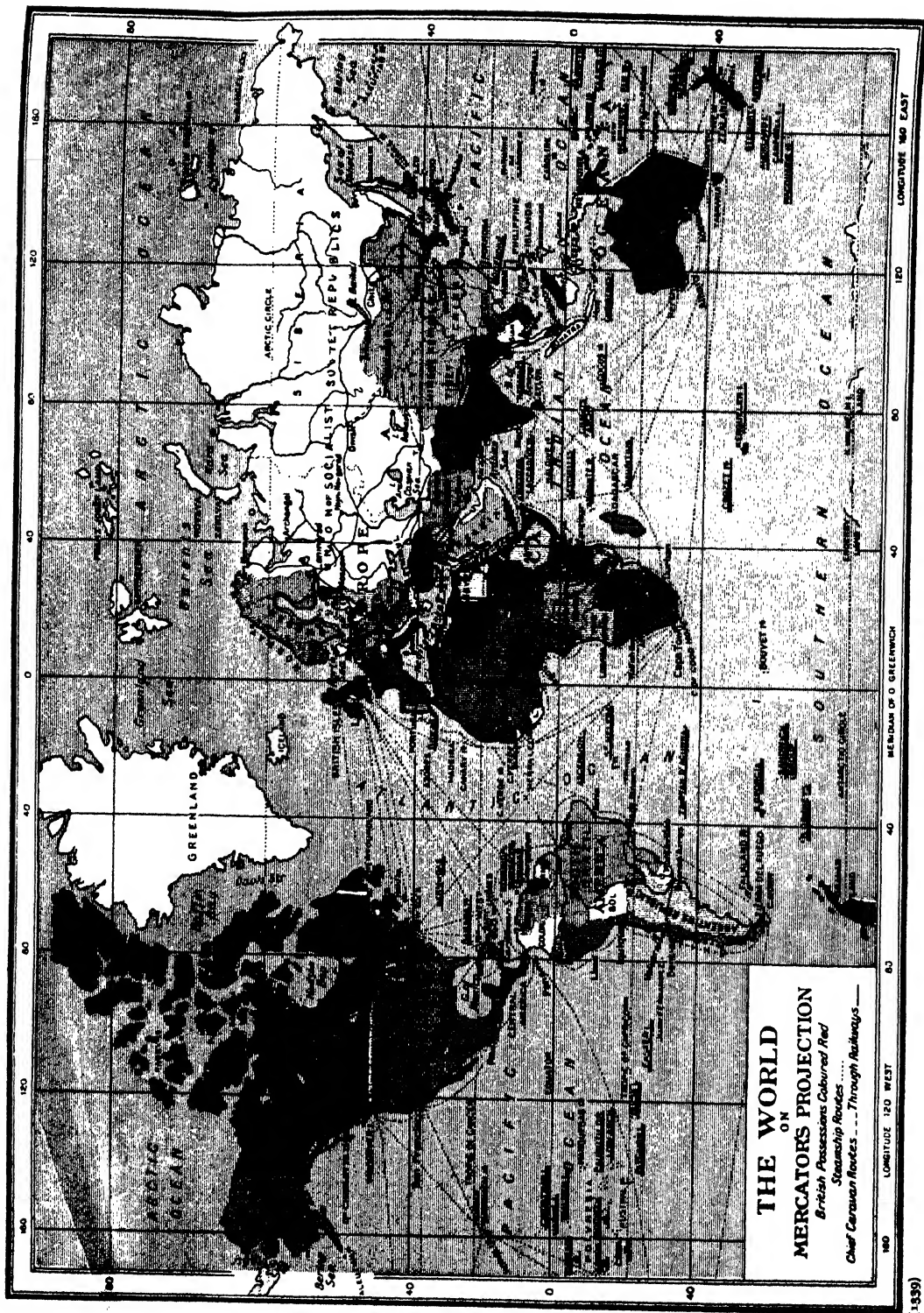
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Pitman's
COMMERCIAL ATLAS
of the
WORLD

WITH AN ACCOUNT OF THE TRADE
PRODUCTIONS, MEANS OF COMMUNICATION
AND THE PRINCIPAL STATISTICS OF EVERY
COUNTRY OF THE GLOBE



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1932

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PARKER STREET, KINGSWAY, LONDON, W.C. 2
THE PITMAN PRESS, BATH
THE RIALTO, COLLINS STREET, MELBOURNE
2 WEST 45TH STREET, NEW YORK
SIR ISAAC PITMAN & SONS (CANADA), LTD.
70 BOND STREET, TORONTO

PRINTED IN GREAT BRITAIN
AT THE PITMAN PRESS, BATH

PREFACE

THIS COMMERCIAL ATLAS has been compiled primarily for the use of those students who are taking a special educational course in which Commercial Geography plays a prominent part.

The maps and the text have been prepared in the light of the most recent events, and the statistics have been drawn from the most reliable sources which are available. Each of the continents has been dealt with separately, and all the different countries or districts of importance have been treated of very fully as to population, means of communication, natural commercial advantages, industries, and manufactures. The physical features have been described briefly, because they are largely the basis of the subject. The product maps will, by their fullness and clearness, enable the essential commercial features of every district to be grasped in an easy and effective manner ; and, when they are examined in conjunction with the facts set out in the accompanying text, the reader will not fail to obtain a thorough and accurate knowledge of those matters in connection with foreign trade which must prove to be of the greatest advantage to the business man.

For the sake of convenience and in order to avoid a multiplicity of cross references, the first section has been devoted entirely to a consideration of Trade Routes.

This work has been thoroughly revised by Mr. W. P. Rutter, M.Com., the author of *The Geography of Commerce* and other books on the subject, and late lecturer in Economics and Commercial Geography, Municipal High School of Commerce, Manchester.

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TRADE ROUTES

SINCE the earliest times, water, from its very nature, has afforded an important means of transporting goods. Local traffic flourished along the shores of navigable streams; and when roads were still in a primitive condition, and transportation by land was in its infancy, an active international trade was carried on by means of the Mediterranean Sea; and at the present time the long-distance traffic of all the great commercial countries of the world is mainly ocean traffic. Water naturally forms the cheapest means of transport, for roads and railways have to be constructed and kept in repair, whereas neither of these expensive processes has to be considered in the case of transit by water. Again, international land traffic is subject to the regulations of the various States through which it passes; while the ocean forms a free international trade route, no country being able to claim more than three miles from its own coasts. But though the foreign trade of nations is of enormous importance, it should not be forgotten that the domestic trade even in industrial countries is of far greater extent.

As regards the land traffic in all the great commercial countries of the world, roads are of less importance than railways, though their position in this respect has been greatly improved by the introduction of the motor vehicle. There are many areas of the world to-day where long-distance transport of goods over rude and good roads is still carried on by human labour or by beasts of burden. Horses, asses, mules, and oxen are used in temperate and sub-tropical lands; camels in the deserts; dogs and reindeer in the Polar regions; elephants in the tropical swamps; the yak and llama among the snowy passes of the Himálayas and Andes respectively; and human porters in Africa (especially where the tsetse fly is found), China, South-Eastern Asia, and Japan. It is probable that the transport problem of desert areas will finally be solved by specially constructed motors, aeroplanes, airships, and railways.

WATER ROUTES

These include ocean, lake, river, and canal routes.

1. **Ocean Trade Routes.** The ocean routes have more than doubled in number during the last sixty years (i.e. since the introduction of steam shipping). In 1870, 90 per cent of the world's maritime trade was done by sailing vessels, whilst in 1932 steamships comprised more than 96 per cent of the world's shipping tonnage. The routes are determined by the amount of traffic that can be obtained at each of the termini; by ease of transit, secured by taking advantage of winds and ocean currents (specially applicable to sailing vessels); by directness, obtained by following an arc of a great circle in the case of steamers; by the avoidance of handling goods through a change in the mode of transport (hence the importance of ship canals); and by the fact that trade is often obtained at several ports. The great circle course is the shortest path between any two points on the earth's surface, and the one the mariner naturally chooses wherever it is practicable, because time is important where valuable and perishable commodities and passengers are concerned. Consideration of the intervention of land, currents, ice, wind, unduly high latitudes, and other difficulties, often makes a modification of the shortest course desirable. In practice, ships usually sail on a series of lines, which, though straight on the chart, nearly represent the curves, so that the change of course is in jumps rather than continuous. "Steam Lanes" have been established, where there is much ocean traffic, and these minimize the risk of collision, for the outward and homeward bound traffic keep to different "lanes."

Sailing vessels, dependent on winds, currents, and tides, often compelled to make wide detours, and incapable of great speed and regularity of time, are important in the nitrate of soda, timber, and grain trade of Western America and on the Cape Route; but it would seem that their only hold on the future is in some irregular trade that cannot be organized. Ocean traffic is of two kinds: "line" traffic, consisting of steamers belonging to regular lines, which make regular voyages on definite routes at definite times; and charter traffic carried on by "tramp" steamers, which have no regular routes nor times of sailing, but go wherever cargo is to be had, and compete for cargoes on the open markets. The tramp is practically a necessity, for many food products and raw materials are available in large quantities only at certain seasons of the year. Tramps carry the great bulk of the world's traffic, the heavy commodities—food and raw

TRADE ROUTES

materials—so essential to the great manufacturing countries. It is estimated that they carry 60 per cent of the world's commerce. Liners handle the trade of high value, like manufactured goods and precious articles; perishable goods, such as fruits; commodities like the mails, which require quick transport; and passengers.

The great ocean trade routes are—

(1) **THE NORTH ATLANTIC.** The greatest ocean trade route is that of the North Atlantic, whose European focus may be said to be in the English Channel, while New York Bay may be considered to be its main American focus. The chief European termini are Liverpool, Glasgow, Southampton, London, Hamburg, Bremen, Amsterdam, Antwerp, and Havre; and the American termini are Montreal and Quebec (summer ports), Halifax, St. John, New York, Boston, Philadelphia, Portland (Maine), Baltimore, Norfolk, Newport News, Wilmington, Charleston, Savannah, New Orleans, and Mobile. The traffic is the largest and most competitive; has the fastest, and most luxurious passenger liners, which are steadily approaching a speed of 30 knots and a size of over 60,000 tons; and provides the best service for freight and emigrants. From Liverpool to New York the distance is 3,080 miles; from Liverpool to Montreal 2,830 miles; from Southampton to New York 3,130 miles. The fastest mail steamers accomplish the voyage from Liverpool to New York in about five to six days. The main westward movement is in passengers, emigrants, and manufactured goods; the eastward trade is in grain, meat, ores, raw material (particularly cotton, tobacco, and timber), and manufactured goods of all sorts, but chiefly machinery. Among the great steamship lines are the Cunard, the Canadian Pacific, the Holland-American, the American, the Norddeutscher Lloyd, the Leyland, the White Star, the Atlantic Transport, the Anchor, and the Red Star.

Smaller ships, but not inferior in design and construction to those of the North Atlantic, are engaged on all the other ocean routes. The mixed passenger and cargo liner is also more common, and the speed is usually about 15 to 20 knots.

(2) **THE MEDITERRANEAN-ASIATIC.** Next to the North Atlantic route in volume of traffic is that *via* the Mediterranean Sea and the Suez Canal to and from India, East Africa, Australia, and the Far East. This route is the creation of the Suez Canal, which was opened in 1869. It has caused the virtual abandonment of the Cape route by mail and passenger steamers, and the return of the Eastern trade to the Mediterranean route. From London to Calcutta *via* the Suez the voyage is shorter by 3,700 miles than *via* the Cape. The route has double termini in the Atlantic in the ports of the east of the United States and those of Western Europe. In the Mediterranean it has many feeders coming chiefly from Barcelona, Marseilles, Genoa, Naples, Venice, Trieste, Odessa, and Alexandria. Passing through the Suez Canal and down the Red Sea to Aden, the main line continues to Ceylon (Colombo) and Singapore; a branch, however, goes to Bombay. At Colombo, vessels for Madras, Calcutta, and Burmah turn northwards into the Bay of Bengal, and the Australian mail steamers turn southward across the Indian Ocean. The routes diverge again at Singapore; a branch goes to Java and East Australia, but the main route proceeds to Hong Kong, Shanghai, and Yokohama. From London to Sydney *via* Suez the distance is 12,500 miles; to Yokohama 11,900 miles; and to Calcutta 8,000 miles. The long distances necessitate the provision of coaling stations. Among these are Gibraltar, Algiers, Malta, Suez, Aden, and Singapore. Southern and Eastern Asia exchange wheat, wool, raw cotton, silk, tea, spices, rice, timber, petroleum, coffee, rubber, tin, sugar, and tobacco for the cottons, hardware, railway plant, machinery, and metal manufactures of Europe and the United States. The chief shipping lines using the Suez route are the Peninsular and Oriental, the Australian Commonwealth, the Orient, the British India, the Nippon Yusen Kaisha of Japan, the Nederland Royal Mail, the Blue Funnel, and the Compania Transatlantica.

(3) **THE SOUTH AFRICAN TRUNK.** This route sweeps boldly along the West African coast to reach Capetown; two streams of traffic unite at or near the Cape Verde Islands—one from the ports of Western Europe and the other from the Atlantic and Gulf ports of the United States. Vessels in the East African trade stop at Port Elizabeth, East London, and Delagoa Bay; and a few continue to Mombasa and Zanzibar. All freight steamers from the United States and Europe use this route to Australia instead of the Suez Route, for though European vessels would save about 1,000 miles by going through the Suez Canal, yet the canal tolls are so high as to make it cheaper for freight vessels to take the longer Cape route. From the ports of the United States to Australia the Suez route is practically as long as the Cape route. The more important steamship lines steam directly from South Africa to Adelaide, Melbourne, and Sydney, while a few continue to Brisbane. The less important lines call at Fremantle, and afterwards run direct thence to New Zealand, or call at Melbourne or Hobart. Vessels engaged in trade with India and the East, after calling at the South African ports and Mauritius, steam north-east to Colombo, and join the Asiatic Trunk route. South Africa is well supplied with bunkering stations, and Cardiff coal can be obtained at Madeira, the Canaries, St. Helena, and Ascension Island. The trade conducted is

one of textiles, cotton and woollen clothing, machinery, and railway plant from the Atlantic centres for the wool, metals (gold, silver, copper, and tin), meat, fruits, cereals, wine, timber, rubber, oils, beverages, diamonds, ostrich feathers, and gums of South Africa, and Australasia. From Southampton to Cape Town the voyage is 6,000 miles; from London to Hobart 12,000 miles; and from London to Wellington 13,200 miles. The Union Castle, Peninsular and Oriental, Aberdeen, Australian Commonwealth, White Star, Federal, Houlder and Shire, British and African Steam Navigation, Bucknall, and Woermann are among the most important lines.

(4) THE SOUTH AMERICAN TRUNK. From the ports both of eastern North America and of Europe, important ocean trade is carried on with South America. The two streams of traffic feeding this route unite off Cape Roque. Vessels call at Rio de Janeiro and Santos for the coffee of Brazil, and at the Plate ports for grain and animal products. The terminus of much of the shipping is Buenos Aires (6,320 miles from Southampton), but some steamers pass through the Straits of Magellan to the southern Pacific ports of South America. Vessels engaged in the New Zealand trade, returning loaded to Europe, sometimes swell the traffic at the Straits of Magellan. Before the opening of the Panama Canal all the trade of Pacific South America with Europe, and most of that with western North America, had to pass round the south of South America. The trade is mainly in manufactured goods and coal in return for cereals, meat, ores, nitrates, wool, cocoa, coffee, tobacco, rubber, fruit, and timber. There is a good deal of outward passenger traffic, but the emigrant traffic is chiefly from the Mediterranean lands. Among steamship lines using this route are the Royal Mail Steam Packet, Booth, Pacific Steam Navigation, Lamport and Holt, and the Hamburg-American and Hamburg Sud Amerikanische D.G.

(5) THE GULF OF MEXICO AND THE CARIBBEAN SEA. Together these form an inland sea, sometimes known as the "American Mediterranean." There are several outlets to the Atlantic: (1) the Florida Strait between Florida and Cuba; (2) the Windward Passage between Cuba and Haiti-Santo Domingo; (3) the Mona Passage between Haiti-Santo Domingo and Porto Rico; and (4) the passages between Guadeloupe and Barbados. All of these outlets are utilized by vessels from the Atlantic ports of the United States and those of Europe; and the traffic is augmented by shipping bound to and from the Pacific *via* the Panama Canal and the Windward Passage. The following ports and centres on the Caribbean Sea are engaged in a brisk trade: Guadeloupe, Port of Spain, La Guayra, Colon, Port Limon, Cartagena, Greytown, St. Thomas, and Kingston. The Gulf ports include Havana, Vera Cruz, Tampico, Belize, Bluefields, Galveston, New Orleans, Mobile, and Pensacola. Fruit steamers ply from the ports of the Central American republics to the Atlantic ports of the United States, and from Jamaica direct to Bristol, Liverpool, Manchester, and Glasgow. The foreign trade is an exchange of sugar, tropical fruits, fine woods, cocoa, asphalt, and tobacco for manufactured goods of all kinds. Some steamship lines plying on this route are the Imperial Direct West India Mail Service Company, Elders and Fyffes, the Hamburg-American, the Manchester liners, and the Royal Mail Steam Packet Company.

(6) THE TRADE ROUTES OF THE PACIFIC. These routes are much less important than those of the Atlantic, but the advance shown by the Eastern nations of Asia in recent years and the opening of the Panama Canal suggest increased importance in the future. Nevertheless, the Pacific will, perhaps for all time, be largely a waste of waters, for the great trade routes will probably always leave its vast centre to solitude or to secondary routes. The most traversed of the two great routes across the Pacific is the great circle route crossing the North Pacific, and connecting San Francisco, Portland, the Puget Sound ports, Vancouver, and Prince Rupert, with the Japanese port of Yokohama, the Chinese Shanghai, the British Hong Kong, and the American Manila. A secondary route from San Francisco to Yokohama *via* the Hawaiian Islands is about 1,000 miles longer. The chief trade is in tea, silk, silk goods, sugar, tobacco, manila hemp, carpets, china, straw-plait, rice, and lacquer ware of Eastern Asia for the cottons, woollens, metal goods, machinery, and railway plant of North America. Some steamship lines using these routes are the Nippon Yusen Kaisha, the Peninsular and Oriental, and the Pacific Mail.

The other great ocean highway of the Pacific, now followed also, in part, by most of the fast traffic between Europe and New Zealand, is the one connecting the Pacific ports of North America with New Zealand and Australia. The voyage from San Francisco to Auckland is *via* Tahiti; that from Vancouver to Sydney is *via* Honolulu and the Fiji Islands; and that from San Francisco to Sydney is also *via* Honolulu and the Fiji Islands. These routes provide quick mail and passenger services from Australasia to Europe, and are served by the lines of the Canadian Pacific, the Canadian-Australasian, and the New Zealand Shipping Company. The South Pacific is deserted except between the forties and fifties of south latitude, where it is traversed by the east-bound traffic *via* Cape Horn for Europe, which consists of Australian wheat and wool, New Zealand mutton and hides, and nickel-ore from New Caledonia.

(7) PANAMA ROUTES. The Panama Canal has made the United States a Pacific power, and

TRADE ROUTES

given her great advantages in South America, Far East, and Australian trade. The Pacific is now placed in closer relations with the manufacturing countries, and the adjustment greatly favours the United States. In general, ships in the Pacific, American, and European trade pass through the Canal. The great saving in mileage is shown in the following table—

To	FROM LIVERPOOL		FROM NEW YORK	
	Magellan Route	Panama Route	Magellan Route	Panama Route
	Miles	Miles	Miles	Miles
Vancouver . .	14,570	8,647	14,160	6,089
San Francisco . .	13,770	7,847	13,135	5,262
Guayaquil . .	10,582	5,382	10,215	2,810
Valparaiso . .	8,747	7,207	8,380	4,633

Formerly all the trade of the Asiatic ports of the Pacific to and from European and Atlantic ports passed either *via* Suez or *via* the Cape of Good Hope. The following table shows that for Asiatic ports east of Hong Kong the Panama route is an advantage to the Atlantic ports of North America, but the Suez route is better for European ports, and even for American ports to the ports of the Indian Ocean—

To	FROM LIVERPOOL		FROM NEW YORK	
	Suez Route	Panama Route	Suez Route	Panama Route
	Miles	Miles	Miles	Miles
Yokohama . .	11,678	12,372	13,504	9,835
Hong Kong . .	9,785	13,957	11,655	11,744

The Canal brings Australian ports nearer to the Atlantic ports of North America, but not to European ports, and brings New Zealand much nearer to eastern North America, and appreciably nearer to Britain. The New Zealand boats now go *via* Panama in place of the Magellan route—

To	FROM LIVERPOOL		FROM NEW YORK	
	Suez Route	Panama Route	Suez Route	Panama Route
	Miles	Miles	Miles	Miles
Melbourne . .	11,654	12,966	13,083	10,392
Wellington . .	12,989	11,056	11,414 (Magellan Route)	8,872

The Panama Canal is proving a great factor in the development of British Columbia, and is bringing about a revival of the round-the-world trading voyages. Ships sail eastward by Suez, cross the Pacific to America, and continue through the Panama Canal, saving time, and benefiting by the abundant supplies of American bunker coal.

(8) THE GREAT TRADE ROUTES FROM GREAT BRITAIN TO THE NORTH SEA AND BALTIC PORTS OF THE CONTINENT. The North Sea trade may be divided into that of the mainland and that of Scandinavia. The eastern ports of Britain, especially London, Harwich, Grimsby, Hull, Newcastle-on-Tyne, West Hartlepool, and the ports of the Forth carry on the trade. The chief European ports engaged are Antwerp (Anvers), Amsterdam, Rotterdam, Bremen, Hamburg, Oslo, Bergen, Christiansand, and Drammen. Copenhagen is the great commercial centre of the Baltic trade. Other ports are Göteborg, Malmö, Norrköping, Stockholm, Helsingfors, Leningrad, Riga,

Reval, Memel, Königsberg, Stettin, and Kiel. Navigation is impeded on the Baltic for three to five months in the winter owing to many of the harbours being ice-bound. The principal shipping firms engaged are the Ellerman's Wilson Steamship Co., Ltd. (Hull and Grimsby to North Sea and Baltic ports), the United Steamship Co. of Copenhagen (Copenhagen, Libau, Newcastle-on-Tyne, and Hull), the London and North Eastern Railway Co. (Grimsby, Hamburg, Rotterdam, and Esbjerg), the General Steam Navigation Co. (London, North Sea, Baltic, Bay of Biscay, and Mediterranean ports), and Messrs. W. H. Muller & Co., Ltd. (London, Rotterdam). To the North Sea countries Britain exports cotton and woollen yarn and manufactures, and machinery; and imports from them dairy produce, colonial produce, timber, metals, beet-sugar, wine, glass, wood-pulp, amber, dyes, toys, watches, ice, and fish. From the Baltic countries she obtains timber, wood-pulp, butter, bacon, eggs, cereals, flax, hemp, and iron-ore; and sends to them woollen goods, cotton goods, machinery, and coal. There is ample choice of route for passengers from Britain to Belgium or Holland—

(a) The Southern Railway Route. London to Dover and by Belgian Government steamers to Ostend (143½ miles).

(b) The Southern Railway Route. London to Queenborough and by the Zeeland S.S. Co's steamers to Flushing (164½ miles).

(c) The Southern Railway Route. London to Folkestone and Flushing (170 miles).

(d) The London and North Eastern Railway Route. London to Harwich and by the L.N.E.R. steamers to Antwerp, Rotterdam, and the Hook of Holland (171 miles).

(e) Several lines of steamers run direct from London to Rotterdam and the Hook of Holland.

THE CROSS ROUTES OF THE ENGLISH CHANNEL. There are six routes open to the traveller who wants to go to France—

(a) The Southern Railway Route. London to Dover and Calais (103 miles).

(b) The Southern Railway Route. London to Folkestone (72 miles) and Boulogne (100 miles).

(c) The Southern Railway Route. London to Newhaven and Dieppe (132 miles).

(d) The Southern Railway Route. London to Southampton and Havre. (Southampton to Havre, 114 miles.)

(e) The Southern Railway Route. London to Southampton and Cherbourg. (Southampton to Cherbourg, 83 miles.)

There is also direct shipment from London to Havre or Rouen. The ports of South Wales and those of the Tyne carry on an important trade in coal with the northern ports of France. Coal, cotton, and woollen yarn and manufactures are exchanged for the dairy produce, vegetables, fruits, articles of fashion, and the silk and linen goods of France. The English Channel is one of the most important ocean ways of the world, for it is used by all the steamship lines of the North Sea ports trading with all parts of the world, and also by the busy packet steamers plying between England and France.

2. **Lake Routes.** An excellent example of a lake route is found in North America. The Great Lakes of North America, five in number, with the St. Lawrence River, and supplemented by a number of short canals, form a system of internal navigation not rivalled in any other continent. The waterway reaches inland 2,000 miles from the sea, and deep-draught ocean steamers can be accommodated at Montreal. Unfortunately, all the lake ports are blocked with lake-shore ice from about the first week in December to the fourth week in April, and navigation then becomes impossible. Montreal is only a summer port; the winter ports are Halifax, St. John, and the Atlantic ports of the United States. Though only open for eight months in the year, the Great Lakes and St. Lawrence waterway carry much of the freight of the inland and coast waterways of Canada and the United States.

3. **Rivers.** Several factors determine whether rivers can be used as trade routes; among these may be mentioned the productivity of the regions through which they flow, convenient depth of water, freedom from ice, and absence of bars at their mouths, and waterfalls and rapids in their courses. Russia is well furnished with rivers, but owing to the fact that many of the rivers are ice-bound for a great part of the winter, and open out into seas frozen for some months in the year, they are rendered useless for commerce in the winter, and even during the rest of the year the freight carried on them is small, owing to the sparse population and regions comparatively unproductive at the present time. An excellent riverway is provided by the Amazon in South America; this river is navigable for ocean steamers for 2,300 miles, from its mouth to Iquitos. Few rivers are naturally navigable for sea-going vessels; often dredging, blasting, and canal and railway construction are necessary to complete the chain of transport. To-day, rivers serve as the means of conveying goods to and from the ports of a country; help, when sufficiently long and deep, to open continental interiors to modern commerce; and tend to keep down rates on competing lines of railway.

4. **Canals.** As a means of land communication, canals are constructed to improve navigation on rivers, to avoid obstacles, to link rivers, and to provide a waterway where no river exists. Their advantages are cheapness for heavy goods and the small cost of repairs; their disadvantages are slowness and difficulty of mounting slopes. Canals have lost much of their old importance, and need revival, but it should be borne in mind that it is only for long journeys that they can beat railways for transport purposes; a fact which explains partially the decay of many British canals, and the success of several continental canals. The great ship canals of the world are mainly isthmian canals, and have been made to shorten trade routes.

(1) **THE SUEZ CANAL.** This first great ship canal, built by M. Ferdinand de Lesseps, largely with French money, cost about £19,000,000 to construct, and involved twelve years' labour, being opened to traffic in November, 1869. More than half the shares in the controlling company are held by the British Government, and some 60 to 70 per cent of the shipping using the canal is British-owned. The saving of distance by the Suez over the Cape route from London to Bombay is about 5,000 miles, to Colombo 4,000 miles, and to Australian ports 1,000 to 2,000 miles. The total length from Port Said to Port Ibrahim by Suez is 87 miles, of which 66 are actual canal, the remainder being a dredged passage through Lake Menzalah, Lake Timsah, and the Bitter Lakes. The canal is 36 ft. to 39 ft. deep (maximum draught allowed 32 ft.), 148 ft. to 195 ft. wide at the bottom, and 400 ft. to 460 ft. between its banks. It is at sea-level throughout, is without locks, and is open to the vessels of all nations in peace and in war. Passing places for large vessels are provided, and by means of powerful electric lights ships pass as safely by night as by day. The time of transit is about 15 hours 20 minutes. To British eastern shipping it is of prime importance, being an essential link between Britain and India. The development of air routes between Europe and the East tends to diminish the importance of the canal in the transit of passengers and mails.

(2) **THE PANAMA CANAL.** The Panama Canal, made available for commercial shipping in 1914, and officially opened on 12th June, 1920, is a lock canal, cut across the Isthmus of Panama from Colon on the Atlantic to Panama on the Pacific Coast, a distance of 50 miles from deep water to deep water, or 40 miles from shore line to shore line. Its width varies from 300 ft. (in the Culebra Cut) to 1,000 ft. (in Gatun Lake), and its depth from 45 ft. to 85 ft. Vessels are towed through the locks by electric motors, no vessel being allowed to pass through under its own steam. The whole passage of the canal takes about 10 hours. Upwards of £140,000,000 were spent on the construction of the canal (French, £62,000,000; American, £78,000,000). Financial extravagance, corruption, tremendous physical obstacles, and the unhealthy climate brought about the failure of the French attempt under Ferdinand de Lesseps; but the Americans, by draining and filling up the swamps, by killing the anopheles mosquito, by thorough general sanitation, and marvellous engineering skill, gained success. Politically, commercially, and strategically, the canal is of most importance to its American owners.

(3) **THE KIEL CANAL** runs across Holstein from Holtenau, near Kiel, to Brunsbüttel, near the mouth of the Elbe, a distance of about 61 miles. It is 144 ft. wide at the bottom and 36 ft. deep, and has four locks at each end. Primarily built for the needs of the German Navy, it is now open to the vessels of all nations, and serves to connect Germany's Baltic ports with her important North Sea ports, and saves about 240 miles from English ports south of the Tyne to Baltic ports. Charges are limited to those necessary to the upkeep of the canal, which is maintained by Germany.

(4) **THE MANCHESTER SHIP CANAL.** By its completion in 1894, the Manchester Ship Canal has made Manchester a seaport for vessels up to 12,000 tons capacity. It runs from Eastham through Ellesmere port, Runcorn, and Warrington to Manchester, a distance of 35½ miles. Its depth is 28 ft., and it has a minimum bottom width of 120 ft., with numerous open side-basins, or widenings, for the accommodation of shipping. There are five sets of locks, each lock being 600 ft. long. The principal docks, with a frontage of more than 4 miles, are on the Salford bank. Lines of steamers start now from Manchester; there is a regular fruit trade with the West Indies, while, in the cotton season, boats run direct from Charleston, New Orleans, and Galveston.

(5) **THE GREAT LAKES AND ST. LAWRENCE CANALS.** The most important of these are the Sault St. Marie Canals ("Soo," Canadian, and U.S.A.) in the St. Mary's River between Lakes Superior and Huron, which avoid the Sault St. Marie rapids, and carry a traffic much greater than that through the Suez; the new Welland Canal between Lakes Erie and Ontario; and the canals at Cornwall, Soulanges, and Lachine.

(6) **THE CORINTH SHIP CANAL,** 4 miles long, cut through the Isthmus of Corinth, connects the Gulf of Corinth with the Gulf of Aegina, and shortens the voyage between the Ionian and Aegean Seas. It accommodates vessels up to 1,500 tons, but is little used on account of its narrowness and its strong currents.

(7) **PROPOSED NICARAGUAN CANAL.** Recently the United States has taken a decisive step towards the construction of a second isthmian canal by voting £30,000 for a survey of the proposed route through Nicaragua. The concession was purchased in 1914 from the Nicaraguan Government for £600,000. The present traffic through the Panama Canal is more than double that forecast, and fears are entertained that the maximum capacity will shortly be reached. A second canal through Nicaragua would relieve anxiety in case of a breakdown or mishap to the Panama Canal, and would shorten the journey from New York to San Francisco by several hundred miles. The port of entry on the Atlantic side would be San Juan del Norte (Greytown), and from this point the canal would run to Ochoa and San Carlos. There are six alternative outlets to the Pacific, the most suitable of which has yet to be decided.

(8) **PROPOSED CANADIAN GEORGIAN BAY SHIP CANAL.** Proposals have been made (but not adopted) to deepen the Canadian St. Lawrence canals to 20 ft., and to construct a new canal. From Georgian Bay, on Lake Huron, the proposed route is *via* Lake Nipissing to Ottawa, whence the Ottawa river is navigable to the St. Lawrence. Of the total distance of 442 miles, less than 50 would be artificial, and there would be a saving of 300 miles on the present route by Lake Erie.

Canals of minor importance are the Scottish Caledonian Canal cut through Glenmore, mainly used by tourist steamers and the Scottish fishing fleets; the Crinan Canal cut through the Mull of Kintyre, saving the long voyage round the Mull of Kintyre; and the Gotä Canal, from Göteborg (Gothenburg) to Söderköping, utilizing Lakes Wener and Wetter.

LAND ROUTES

For an island country like Britain, and with an oceanic empire, the ocean highways are of vital importance; but in countries like Russia, with a vast extent of united land, and though well watered, yet provided with few important navigable rivers, good roads and railways are absolutely essential if the country is to be developed. Good means of transportation are frequently as important as, or more important than, the production of commodities; soil, climate, and labour may be available for a particular commodity, but if the means of conveyance to market, whether local, city, or world, are lacking, the production of the particular commodity must frequently be abandoned. The growth of the United States in industry and commerce was comparatively slow till railways began to open out into the productive Middle West, and on to the Pacific Coast; again, the continued growth of the Canadian North-West depends largely on the development of railways. The present century is the age of quick transit. Railways are not only of prime importance to the old settled countries of the world with their high state of industrialism, but to the new countries whose present prosperity comes from agriculture and other extractive industries, in order that their surplus products may reach the terminal oceanic ports, whence they may be conveyed by liners or tramps to the great industrial nations who need these products. When there is trade or the probability of trade arising with the birth of a good transport system, railways come into existence. Their direction depends mainly on the relief of the land (detours being made to avoid heights and steep gradients), and the productivity of the region traversed.

Transport by rail is still the most important method of inland transport, but has now to face serious competition from road transport by motor-truck and motor-bus.

1. **European Railways.** The countries of continental Europe have obtained their superior network of railways largely as the result of State enterprise; and, though many of the lines were planned chiefly for strategic purposes, commercial reasons were also present. Many sea avenues lead into the heart of Europe, thus lessening the need for the easy east-west railway routes of the Great European Plain. North-south lines meet the southern mountain barriers—the Alps some two degrees in width, the Pyrenees, and the Caucasus. Yet, largely on account of the alternative west-east cheap water transport, these are the most important lines. The Rhine and the Rhone provide easy passages at each Alpine end, and there are numerous passes without remarkable difficulties. Thus, the Mont Cenis leads from the Rhone Valley to Turin; the Simplon and St. Gotthard carry lines to Milan; the Brenner leads to Verona; and the Semmering to Trieste and the Adriatic.

Paris and Berlin are the foci for north-south routes and for the busiest part of the plain, where the railway network is closest; and Moscow is the chief focus in the partially developed eastern part of the plain, where lines are comparatively few. From Paris a trunk route runs *via* Tours and Poitiers to Bordeaux. Thence it runs along the narrow coastal strip between Bayonne and San Sebastian to avoid the high, narrow Pyrenean ridges; and crosses the Iberian plateau to Madrid (900 miles). From Madrid it proceeds south, utilizing the Guadalquivir Valley to Cadiz, the port for Tangier and Morocco. The main route to Lisbon runs south-west from Medina (124 miles before Madrid); but a line from Madrid descends the Tagus Valley to Lisbon. The Paris-Lyon-Mediterranean Railway, the present route of most of the overland mail and passenger traffic between Britain and the East, saves six days on the voyage to and from London. From Paris

the route is up the Yonne Valley, past Dijon and Aries, and down the Rhone Valley to Marseilles (540 miles). A branch from Tarascon crosses the Rhone, and passes by Nîmes, Narbonne, and the Col de Pertus to Barcelona and the towns of eastern Spain. The main line continues along the Riviera coast, joining the Italian railways leading to Genoa, Rome, and Naples. Express traffic from Paris to Italy is more direct. It leaves the Dijon-Marseilles lines at Maçon, and passes by Chambery and Modane, through the Mont Cenis tunnel ($7\frac{3}{4}$ miles long), Turin, Genoa, and Pisa to Rome (900 miles), and Naples (1,060 miles). From Turin a route passes along the east of the Apennines to Taranto and Brindisi, the mail port for the Far East. Another route from Paris leads from Dijon to Pontarlier; crosses the Jura at the Col de Jougne; descends to Lausanne; follows the Lake of Geneva and the Rhone Valley to Brieg; and then crosses the Alps in the Simplon Tunnel ($12\frac{1}{4}$ miles long), and proceeds to Milan (550 miles), Venice (720 miles), and Trieste (870 miles). The shortest route from London to Italy is *via* Calais, Amiens, and Chalons, through the Vosges to Basel, and thence by Lake Lucerne and the St. Gotthard Tunnel ($9\frac{1}{2}$ miles long), to Milan (755 miles). The *Orient Express* route from Paris to Istanbul (Constantinople) ascends the Marne Valley past Epemay and Chalons. Thence striking eastwards by Nancy and Strasbourg, it crosses the Rhine; runs along the base of the Black Forest; and winds along the Neckar Valley, past Stuttgart and on to Ulm. Thence it runs eastward to Munich and Salzburg; rejoins the Danube Valley; and follows that valley past Vienna (870 miles), and Budapest to Belgrade. Here the line enters the Balkan valleys; ascends first the Morava Valley to Nish (whence it sends a branch line *via* the Vardar Valley to Salonika, 1,730 miles); thence crossing high ground it reaches Sofia and the Maritza Valley, which it descends; and, finally, traverses the plain to Istanbul (1,960 miles). The railways of Asia Minor and the Bagdad Railway may be considered a continuation of this route; and with the establishment of a train-ferry on the Bosphorus and further railway construction, there will come a through route to the Persian Gulf from the North Sea ports and London when the proposed Channel Tunnel from Dover to Sangatte and train ferries from Richborough become realities. Another and shorter overland route to Istanbul is the Simplon Orient route. From Paris the line proceeds *via* Lausanne and the Simplon Tunnel to Milan; thence it passes north of Trieste into the Save Valley, which it descends to Belgrade, where it joins the longer Orient route.

Important trade routes lead from Paris by the Oise and Meuse valleys and Cologne to Berlin (680 miles). Eastwards from Berlin there are three trunk lines. The most northern crosses the Oder and Vistula to Marienburg; runs north-east to Königsberg, thence east to Vilna, and, finally, to Leningrad (980 miles). The middle route passes through Thorn, Warsaw, and Smolensk to Moscow (1,200 miles); while the southern, skirting the northern slopes of the Carpathians, leads through Lwów (Lemberg) to Odessa (1,040 miles). Southward from Berlin runs the important Nord-Sud express by Munich and the low Brenner Pass to Verona and Venice (800 miles). All the important North Sea, English Channel, and Baltic ports have direct connection with both east-west and north-south routes; and several routes have been straightened by tunnelling. Thus, the Lötschberg Tunnel, linking Kandersteg with Leukerbad, provides a direct route to Zermatt; and the 10 miles of tunnels in the Karawanken and Julian Alps give a shorter connection between Vienna and Trieste. Both Leningrad and Moscow have direct lines to the Trans-Siberian Railway; and from a point a little east of Samara, a line branches south-eastwards past Orenburg, and runs by the Syr-Daria Valley to Tashkent, where connection is made with the Trans-Caspian Railway. Southward from Moscow two main routes run to Odessa and Rostov, then on to Baku; from whence another railway, running parallel to the still unconquered Caucasus and utilizing the Suram Pass, reaches Poti and Batum.

Copenhagen is connected by rail and train ferries with Esbjerg, Kiel, Warnemünde, and Malmö. From Malmö a line crosses the lowlands of south Sweden to Stockholm (370 miles), and continuing northward along the Baltic plains reaches Haparanda (1,180 miles). A line from Bergen and Oslo, which runs through the difficult mountain country of south Norway (where it traverses 23 miles of tunnels, and reaches a height of 4,268 ft.) joins the Malmö-Haparanda route, 135 miles north of Stockholm, and at Boden connection is made with the Lapland Railway from Narvik. From Haparanda the route leads to Tornea; whence the Finnish railways skirt the plateau of Finland, and sending branches to the chief ports finally reach Leningrad, after a course of 735 miles. A line from Leningrad to the northern ice-free port of Murmansk (960 miles) enables Russia to ship produce all the year round.

2. **Asiatic Railways.** Asia, the seat of ancient civilizations, the continent of enormous distances, and of the oldest extended commerce, is an infant in modern transport. The great mountain and plateau system of the centre will probably long prohibit railway intrusion; and vast deserts, swamps, wide rivers, and Arctic ice are other railway obstacles. Large areas still lie undeveloped, and caravans, although on the wane, carry much of the traffic of interior Asia. Uniformity of

gauge is absent; and only one transcontinental line is in existence. Railways, however, are steadily increasing.

THE TRANS-SIBERIAN RAILWAY (first section to Chelyabinsk and Omsk from Zlatoust, with branches to Tomsk and Ekaterinburg, completed in 1895; main line carried to Transbaikalia in 1901; section round Lake Baikal, a mountainous district which presented enormous difficulties, completed during the Russo-Japanese War) follows the military road and the ancient trade route between Russia and the Far East. Its Pacific termini are Port Arthur, Tairen (Dalnyi), and Vladivostok. Leningrad (5,882 miles by rail from Port Arthur; 5,500 miles from Vladivostok, and 6,000 miles from Pekin) is reached in about ten days. The rivers Obi, Yenisei, and Irtysh, which serve as feeders for north and south traffic, are spanned by huge bridges, 2,000 ft. to 3,000 ft. long. Two lines, one from Leningrad and the other from Moscow, join at Chelyabinsk (the western terminus of the T.S.R.), and thence the route traverses the steppes, by way of Kurgan, Petropavlovsk, and Omsk to Novo Nikolaievsk, whence the Altai Railway taps the rich steppe lands and mineral fields of the Baraba Steppes, running *via* Barnaul (whence subsidiary lines run to the coal-fields of Kuznetsk and Busk) to Semipalatinsk. Proceeding eastwards the main line throws off a branch from Taiga to Tomsk, and passing through Atchinsk (branch to Minissinsk), crosses the Obi at Krasnoyarsk, and follows the Angara Valley to Irkutsk. Curving round the southern shore of Lake Baikal, and ascending from the lake, the line reaches Tchita, leaving Kiakhtha to the south. (Sooner or later the line from Pekin, which has already been constructed beyond Kalgan, will be extended to Urga and Kiakhtha, and will link up with the T.S.R.) Descending into the Amur basin, the line divides into two branches at Karimskaya. One branch, the original line, strikes south-east, leaves the Amur Valley, and crosses the high bleak plateau of Chinese Manchuria to Vladivostok. The other branch follows an all-Russian route to the Pacific, crosses the Amur at Khabarovsk by a bridge $1\frac{1}{4}$ miles long, whence the Ussuri Valley line carries it to Vladivostok. At Kharbin, in Manchuria, a southern branch passing through Mukden to Port Arthur is connected with the Chinese railways. Gradients on the western section of the line as far as the Obi are easy, nowhere exceeding 1 in 135. Farther east, however, they rise to 1 in 66. The Trans-Siberian Railway is the one real artery of the country, the link by which the West keeps touch with the East; it has promoted settlement, and on it depends future settlement; and it is a very valuable quick route for passengers and mails between Europe and the Pacific, bringing Vladivostok within twelve, Pekin within fourteen, and Yokohama within sixteen days of London. As a carrier of through freight, however, its value lies only in the transport of valuable products, such as silk, tea, machinery, and furs, and several branch lines are needed to develop the mineral and agricultural resources of Siberia and Manchuria.

THE TRANS-CASPIAN RAILWAY, part of a possible route between Europe and India, and a present trunk route from interior Asia, runs from the ports of Usanada and Krasnovodsk on the Caspian for 1,200 miles through Askhabad, Merv, Charjui, Bokhara, Samarkand, Khojend, Kokand, and Marjilan to Andijan in Ferghana, with branches to Tashkent and Kushk on the Afghan frontier. Saxaul hedges in the south and west keep frequent sand-storms from engulfing the line. Another line, the Tashkent-Orenburg, in direct communication with Moscow, runs north and south, *via* the valley of the Syr-Daria and Tashkent to Kokand and Andijan, connecting with the Trans-Caspian at Chernyaev. These railways are important not only for their strategic value, but as highways of trade between Europe and Central Asia. Afghanistan has no railways; and, as yet, political complexities and engineering difficulties prevent the railway connection of Kushk with Quetta, to complete the through route from India to Europe. Recently, the railway has reached Persia. A branch from the Baku-Black Sea line passes through Armenia to Tabriz in north Persia. A prolongation of this line, through Teheran and Seistan to Quetta and Gombur, would bring London within a week of India.

The most important Chinese railway will probably be the present north and south trunk which links Tientsin with Pekin, and Hankow, and is to be extended through the Cheling Pass and Pei Valley to Canton. From Tientsin a line goes to Mukden (520 miles) and connects with the south Manchurian railway and the Siberian system. Tientsin is also joined to Shanghai. From Pekin a line goes north-west to Kalgan, and will be extended along the old tea-route to Urga, Kiakhtha, and the Siberian Railway. Yunnan-fu was reached in 1910 by a French railway (450 miles long) from Haiphong on the Gulf of Tonquin. Across Yunnan are the shortest land routes between India and China. From Canton to Calcutta *via* Yunnan is 1,600 miles; by sea the route is 4,000 miles. A great trunk railway may assume shape joining Canton with the European system at Istanbul, the African at Cairo, and the Russian at Kushk.

Steep gradients and circuitous routes are characteristic of the railway system of Japan. The main lines run throughout the length of Honshu, and connect Honshu and Kiushiu. A railway runs from Kagoshima, with branches to Nagasaki and Sasebo, through a coal-mining

region to Moji, opposite Shimonoseki. From this point a railway runs along the south and east coasts to Aomori and connects Kobe, Osaka, Yokohama, Kyoto, and Tokyo. In Yezo a line from Hakodate proceeds through Sapporo and the Poronai coal-field to the capital of the island.

A trunk line, in the Malay Peninsula, joins Singapore, Penang, Bangkok and the upper Menam Valley, saving $4\frac{1}{2}$ days over the sea journey from Singapore to Bangkok. From Rangoon the Burma Railway runs up the Iráwadi to Prome (with branch to Bassein), and up the Sittaung Valley to Mandalay, Wuntho, and Myitkyina (800 miles). Four gauges are used on the Indian railways, ranging from 2 ft. to the standard 5 ft. 6 in. The direction of the routes depends largely on the build of the country, the main routes radiating from Karáchi, Bombay, Goa, Madras, and Calcutta. From Bombay lines run to Baroda and Ahmadábád, through Rájputána, skirting the western base of the Aravalli Hills to Delhi; through Kotah and Muttra to the rich grain-producing areas of the Punjab and the United Provinces; through the Khandwa Gap to Allahábád and Cawnpore; through Nagpur to Calcutta; and through Poona across the Deccan to Madras; while southwards a line proceeds to Goa. A line crosses the peninsula from Goa to Madras, and proceeding southward to Madura and Tuticorin, is continued *via* the Manaar peninsula, Dhanushkodi and Pamban to the Talaimannar Ferry of Ceylon. From Madras the East Coast Railway to Calcutta gives now a direct route, and through the Palghát Gap Calicut is connected. In the Indo-Gangetic Valley, the flat nature of the country has facilitated the construction of a great network of railways. The Ganges system runs from Calcutta to Patna, Benares, Allahábád, Lucknow, Agra, and Delhi. The North-Western is the carrier of the Punjab traffic, and links the Ganges system through Amritsar and Lahore with the Indus-Karáchi system, which has a branch running to Quetta and the Afghan frontier. Farther north the railway reaches Peshawar. From Chittagong a line runs to Sadiya and is being connected with the Burmese system.

Caravan routes through the desert and arid countries of Central and South-west Asia are still important links in the trade between India, China, and the Near East, though a few railways have been built or are projected along some of the routes. Between the Persian Gulf, Irak (Mesopotamia), and the Levant, the Bagdad Railway (nearly completed) is supplanting the caravan traffic. This line, conceived and built largely by German enterprise, has a gauge of 4 ft. $8\frac{1}{2}$ in. From Scutari it runs *via* Afium Kara Hissar (junction for Smyrna), Konia, and the Taurus (east of the old caravan road through the Cilician Gate) to Adana and Aleppo (840 miles), overcoming the difficulties of the Taurus range by means of four tunnels, and sending branches to Mersina and Alexandretta. At a junction 8 miles north of Aleppo, the main line continues eastwards; crosses the Euphrates at Jerablus; reaches Nisibin near Mosul; and will, eventually, follow the Tigris Valley to Bagdad (1,500 miles from Istanbul). From Bagdad the line extends to Qalat Shergat, beyond Tekrit, and southwards it is completed to Basra (1,800 miles). It is claimed that London will be reached in six days by express train from Basra. A line is projected from Basra along the northern shorelands of the Persian Gulf *via* Bushire and Bandar Abbas to Karáchi. Through Aleppo the Syrian railways join the Bagdad line; and from Rayak junction (branch to Beirut) lines proceeding south and south-west change to 3 ft. 5.3 in. gauge. At Damascus (branch to Haifa) the Hejaz Pilgrim Railway runs for 820 miles eastward of the Jordan rift valley through the desert to Medina, whence it will finally reach Mecca. Jaffa has railway connection with Jerusalem; and the main railway of Palestine, from Haifa to Kantara, links up by ferry with the Egyptian State Railways.

3. Canadian Railways. There are two great railway systems in Canada, the Canadian National Railways and the Canadian Pacific Railway. Each has a transcontinental line and a network of branch lines connecting the principal urban and rural centres throughout the Dominion. The main line of the *Canadian Pacific* (2,885 miles) runs from Montreal to Vancouver. From Montreal it ascends the Ottawa valley; skirts the north shore of Lake Nipissing; passes the nickel district of Sudbury; skirts Lake Superior to Port Arthur and Fort William; and reaches Winnipeg, the nodal point of all east and west traffic. Thence the line crosses the prairies *via* Regina, Moose Jaw, and Medicine Hat to Calgary; follows the Bow River valley; and near the Kicking Horse Pass (5,300 ft.), in the Rockies, reaches its highest point. Leaving the Rockies, the line formerly crossed the Selkirks, but now utilizes the Connaught Tunnel (5 miles), and, finally, running along the edge of a precipice in the Fraser valley, and then round the winding shore of Burrard Inlet, reaches Vancouver. In addition to this, the Canadian Pacific has nearly 12,000 miles of branch lines in Canada alone, radiating in all directions. Of these, the most important are those from the Atlantic port of St. John to Montreal; Montreal to Toronto and Detroit; Toronto to Sudbury; and the Crow's Nest Pass Kettle Valley Line through southern British Columbia. Over 5,000 miles of railways in the United States are controlled by the C.P.R., and by their means direct entry into Canada is obtained. The "Soo" line, which provides service from Chicago and St. Paul to both Winnipeg and Moose Jaw, is the most important. The Spokane International and

C.P. route links the North Pacific states with Western Canada. Direct connections are also made in Eastern Canada from both Montreal and Toronto to Chicago, New York, Boston, and Portland.

THE CANADIAN NATIONAL RAILWAYS (approximately 23,000 miles of trackage) constitute the largest publicly-owned railway system in the world. The lines run to every provincial capital and almost every city, town, and village of importance in Canada, and to Portland (Maine) and Chicago in the United States. Operations are facilitated by dividing the system into three operating sections, the Atlantic Region (headquarters, Moncton), the Central Region (headquarters, Toronto), and the Western Region (headquarters, Winnipeg). The Grand Trunk Division operates in the United States, and a part of the Central Region is administered locally from Detroit. St. John, Halifax, Vancouver, and Prince Rupert are the coastal termini of the lines, and the general headquarters are at Montreal. From Halifax the transcontinental line makes a circuitous route from Moncton in order to remain on Canadian territory. It proceeds from Quebec along the plateau north of Lake Nipigon, keeping an almost direct course to Winnipeg; thence it strikes north-west through Saskatoon and Edmonton; and goes by the Yellowhead Pass (3,700 ft.) and Fraser valley to Vancouver, and *via* the Skeena valley to Prince Rupert. A route of importance to the wheat traffic is the Hudson Bay Railway, recently constructed. At The Pas connection is made with the National, and the line runs to Churchill (511 miles) on Hudson Bay. This line brings the prairie wheat-fields 1,000 miles nearer Europe than by the St. Lawrence route. Authorities are agreed that the Hudson Bay route is safe from early in July to early in November for ships which can navigate among ice.

Among local railways may be mentioned the Temiskaming and Northern Ontario Railway, which connects with the National Transcontinental at Cochrane, and assists in opening up the Great Clay Belt to settlement.

4. **Railways of the United States.** There are 260,000 miles of railway in the United States. A network of railways extends over the populous east and over the north-east of the Central Plain, and great transcontinental lines connect the eastern roads with the Pacific ports. The arid and highland areas of the west, though crossed by various lines, still prove a barrier to trade, and there is comparatively little transcontinental trade done. The Appalachian system on the east has also necessitated high gradients on the railways running to the Atlantic ports; the only easy route is that by the Hudson and Mohawk valleys, which has largely aided the growth of New York. Uniform standard gauge and powerful locomotives are great aids in long-distance haulage and the negotiation of heavy gradients in North America.

The New York Central and Hudson River railroad follows the Hudson-Mohawk valley through the region of the Great Lakes *via* Buffalo and Detroit to Chicago (980 miles), the starting point of through lines north-west of St. Paul (400 miles from Chicago) with connections to Winnipeg and Montreal. The Great Northern and Northern Pacific system (under one control) links Seattle, Tacoma, and Portland with St. Paul and Lake Superior; and the St. Paul system connects the ports on Puget Sound with Lake Superior, St. Paul, Milwaukee, and Chicago. By the Great Northern, Seattle is distant from St. Paul 1,820 miles, from New York 3,150 miles. A route from New York crosses the Appalachians, and proceeds through Pittsburg to Chicago and Omaha, whence the Union Pacific, the first transcontinental railroad constructed in the United States, runs up the Platte valley, past Ogden, and *via* the Great Basin and the Sacramento valley to San Francisco (3,270 miles). Other lines run north-east to Toronto and Montreal (850 miles), and south by the Mississippi valley to New Orleans (910 miles). Philadelphia and New York are linked directly with Chicago by means of the Susquehanna valley in the Appalachians, and a saving of 70 miles is effected over the route *via* Buffalo. From Philadelphia and Baltimore a route crosses the Appalachians by the Potomac valley, and reaches St. Louis, which is connected with the Atchison, Topeka, and Santa Fé system starting at Kansas City. The route traverses the arid lands of Arizona to Los Angeles and San Francisco (3,320 miles from Baltimore), whence a line runs to Portland. A southerly route from Baltimore and Washington leads south-west to New Orleans, and by the Southern Pacific continues westward along the Mexican border to Los Angeles and San Francisco (2,490 miles from New Orleans), making several connections, notably at Laredo and El Paso, with the Mexican railways. From Salt Lake City the Oregon Short Line runs to Portland; the San Pedro to Los Angeles; and the Western Pacific to San Francisco. The Kansas City, Mexico, and Orient route, planned to run to Topolobampo, near the mouth of the Gulf of California, to furnish the shortest railway route to the Pacific for a large part of the southern states, and even from the eastern seaboard, has been abandoned after part completion. In the competition for the transcontinental trade the northern and southern routes are more favourably placed than the central; but the Southern Pacific, although it has the shortest land-carriage, has the disadvantage of crossing the most arid part of the United States. A noteworthy feature of the railways of the United States is the light railroad for electric cars. In the Lake and Prairie states,

where there are no very heavy gradients and where suburbs are growing rapidly, the electric railway has reached its highest development.

The eastern railways have a large passenger traffic, and share largely with the southern roads in the import and export trade of the United States; coal, lumber, wheat, meat, cotton, and manufactured goods figure prominently in the freight returns. On the south-west roads wheat, corn, lumber, cotton, and live-stock are transported to the Gulf ports. The through traffic of the northern transcontinental roads is one of grain, flour, and manufactures westward, and fruit and Oriental goods eastward. The traffic of the southern transcontinental lines is similar to that of the northern, with an eastward movement of cattle added.

5. Mexican and Central American Railways. Mexico presents many natural obstacles to communications. Most of the railways have to be carried to a height of from 8,000 ft. to 10,000 ft., involving great engineering difficulties, and many of the lines suffer from gaps in construction which lessen their value. The chief railways are the Mexican (520 miles), the Tehuantepec (184 miles), the Mexico North-Western (512 miles), the Southern Pacific (1,000 miles), the United Railways of Yucatan (500 miles), and the Constitutional Railways of Mexico (State). From Mexico City railways run north to the railroads of the United States, on the eastern side through San Luis Potosi and Monterey, in the centre through Leon and Chihuahua, and through Mazatlan and Guaymas on the western side. Westwards from the capital lines pass through Colima to Manzanillo, southwards through Puebla to Oaxaca, eastwards to Vera Cruz, and south-east to the Tehuantepec line running from Puerto Mexico to Salina Cruz. The route from Topolobampo, north-east across Mexico and the United States through Presidio to St. Louis and New York, lacks two stretches of about 100 miles each to make it a quick route from Europe to Australasia. Railway construction is proceeding along both the Atlantic and the Pacific shores. A railway between Toluca and Zitucuaró (81 miles) is nearing completion.

With the exception of the Panama Railway from Colon to Panama (47 miles), the Central American railways are, as yet, of small importance. Heavy gradients, luxuriant vegetation, and volcanic disturbances hinder transport; and many gaps occur in the proposed trunk line along the isthmus. The International Railway Company of Central America, however, is making steady progress.

6. South American Railways. South America, like Africa, is one of the undeveloped assets of the world, and this fact has encouraged the expenditure of European (and especially British) and American capital on South American railways. Railway routes encounter the physical obstacles of high plateaux and mountains, swamps, jungles, and unhealthy coastal districts; traverse lands of differing and often unstable political control; and show, unfortunately, owing to each republic developing its own railway system without regard to those of its neighbours, no less than fourteen different gauges, ranging from 1 ft. 8 in. to 5 ft. 6 in., the metre gauge being the commonest. Inter-connection between the republics is, therefore, particularly difficult. Population is peripheral, and so the main work of the railways is in linking seaports with their hinterlands. Argentina and Chile show the most progressive railway-building. As in Africa, a through route, a Pan-American railroad, has been proposed, to link Alaska to Buenos Ayres and beyond, but the probability seems remote.

The only transcontinental line runs from Buenos Ayres to Valparaiso (888 miles). On the Argentina pampas and Chilean lowlands, which form over two-thirds of the route, the gauge is 5 ft. 6 in., but in the Andes the metre gauge is employed, necessitating the Abt system. By zigzag courses, in the Andean valleys, the railway attains a height of about 2 miles; tunnels under the Upsallata Pass; and descends the steep Chilean slopes in a series of screw-shaped tunnels. A line which is nearly complete across the continent starts from Buenos Ayres; proceeds north-west by Rosario and Tucuman to Jujuy (940 miles); skirts the Andes to the west and the wild Chaco to the east; and reaches the Argentina frontier at Quiaca by a stiff gradient, where rack sections are necessary. From the frontier the line is being continued to link the Argentine railways with those of the Bolivian and Peruvian highlands and their western coastal connections. From Rio de Janeiro, main lines extend north to the San Francisco valley (625 miles), north-west to the Paraguay valley, and south-west to Montevideo (1,980 miles), from whence a route running parallel to the ocean coast sends branches to every important harbour on the coast. North from Rio de Janeiro there is a railway through the diamond district to Bahia, and thence to Joazeira; and farther north Teresina is joined to San Luiz. The only railway in the Amazon valley is one of about 200 miles, past the rapids on the Madeira river, from Porto Vello to Guajaro Merim. From Asuncion, the capital of Paraguay, a line proceeds south-east to the Paraná (230 miles), and, by train ferry, trains reach Posados, whence an Argentine line goes south to Buenos Ayres. Argentine railways radiate from Buenos Ayres, intersecting the Pampa in all directions, and gathering to a second nucleus at Rosario, and a third at Bahia Blanca. The flat Pampa is an ideal country

for laying sleepers and metals, but the Government is now pushing forward state-owned railways in more difficult country, both in the far south and in the sub-Andean region of the north-west. An existing line from Bahia Blanca, due west to Neuquen, is planned to reach the Chilean coast at Concepcion. In 1914 Chile completed her longitudinal railway, which runs from Iquique (Lat. 20° S.) to Puerto Montt (41° S.), a distance of 2,000 miles. Its branches to east and west serve the chief ports, and penetrate the Andine foothills, but breaks in gauge hinder transport. Three lines climb the Andine barrier—the Trans-Andine (already described); the British-owned Antofagasta and Bolivia line, through the nitrate, copper, and borax zones to and beyond the Bolivian frontiers; and the Arica-La Paz line, which provides Bolivia with direct access to the sea. Two additional lines are planned to connect Chile and Argentina—in the south through Lonquimay, and in the north at Salta. The railway from Uyuni to Tupiza, when completed, will make it possible to travel by rail from La Paz to Buenos Ayres; and that from Yacuiba, on the Bolivian southern frontier, to Santa Cruz, under construction, will open up a fine new farming region. Two Peruvian railways climb from the coast to the Andes: the Central Railway from Callao through Lima to Oroya, tunnelling the Andes at a height of 15,865 ft., and the Southern Railway from Mollendo by the Arequipa Pass (14,660 ft.) to Puno and Cuzco. From Oroya a line runs north to Cerro de Pasco, and another one south through the valley of the Mantaro to Huancayo. Some day Peru may be traversed by the Pan-American Railway, planned to pass from Panama following the Andes south to Argentina, and by an east-west transcontinental route *via* the Amazon. The only important railway of Ecuador runs from Guayaquil to Quito (287 miles), and reaches a height of 10,800 ft. on the Ambato plateau. Narrow-gauge railways, few and of little commercial importance, have been built in mountainous Colombia and Venezuela. The difficulties of the routes are clearly shown in the line from Carácas to La Guaira, its port (7 miles), which zigzags for 24 miles over the mountains.

7. **Australian and New Zealand Railways.** Much of Australia is arid and semi-arid, and, therefore, undeveloped. The civilized population is mainly peripheral, the east, south-east, and south-west coasts showing the densest population. The Federal and State railways, therefore, are chiefly coastal, pushing branches into the interior and thus connecting mining, pastoral, and agricultural regions with their seaports. There is one transcontinental line (Federal and State), which has overcome remarkable desert difficulties. Its importance is great for political purposes and for passenger and mail traffic, though not for through goods traffic. Unfortunately, the different gauges, 5 ft. 3 in., 4 ft. 8½ in., and 3 ft. 6 in., of the different states, render interstate communication costly. The State capitals are noteworthy port-railway foci, and all are connected with each other by rail. It is possible to make a continuous train journey from Meekatharra (Western Australia) to Dajaraa (Queensland), a distance of 5,500 miles. The Trans-Australian Railway, opened in 1917 (Commonwealth section, Kalgoorlie to Port Augusta, 1,051 miles), runs from Perth (branch to Fremantle through Kalgoorlie to Port Augusta (1,425 miles). At Port Augusta connection is made with the older railway system, which runs to Adelaide (1,685 miles), Melbourne (2,170 miles), Sydney (2,760 miles), and Brisbane (3,480 miles). Another transcontinental line, partially constructed, proceeds north from Port Augusta to Alice Springs (500 miles), and from Darwin, in the north, the line has been carried through Mataranka to Birdum (316 miles). Probably this line will be linked up with the Queensland railway which runs out to Cloncurry and the Barkly Tableland. The chief routes from the coast into the interior, usually over heavy gradients, are the Queensland routes—Townsville to Cloncurry, Rockhampton to Longreach, Brisbane to Charleville and Cunnamulla; the New South Wales routes—Sydney to Bourke and Cobar, Sydney to Wagga, Sydney to Hay; the Victoria routes—Melbourne to Swan Hill, Melbourne to Mildura; the South Australian routes—Adelaide to Port Augusta, Adelaide to Broken Hill; and the West Australian routes—Perth to Albany, Perth to Geraldton, Geraldton to Meekatharra and Sandstone. Canberra, the federal capital, is joined to the New South Wales system, and will be connected with its future port at Jervis Bay. In Tasmania the main line from Hobart to Launceston and Hazlewood has branches to the mining and agricultural regions.

The main railway routes of North Island, New Zealand, are from Wellington north-east to Napier, north-west to New Plymouth, and north to Hotso, near Auckland. In the South Island lines run from Invercargill through Dunedin, Oamaru, Timaru, Christchurch, and Lyttelton to Mackenzie, with branches to the north and west; and from Nelson to Greymouth and Hokitika. A line across South Island has been completed through the Otira tunnel under the Southern Alps, connecting the west coast collieries with Christchurch.

8. **African Railways.** The plateaux of Africa backed by bordering coastal mountains, the newness of the major portion of the continent in commerce, the tropical swampy malarial coastal plains, the vast deserts, and the almost impenetrable forests, account for the small railway mileage. Railway construction has taken two forms: lines from the ports into the interior (sometimes in

advance of trade), and lines linking up navigable stretches of rivers. The principal gauges are the 3 ft. 6 in. and the metre gauge on account of the heavy gradients and the comparatively small volume of traffic. Transcontinental lines are absent; nor is there great need for them, although the modern development of Africa has been and is bound up with railway construction. Some idea of the difficulty of building railways from the coast to the interior plateaux may be gained from the facts that on the South African railways there are several gradients of 1 in 35, curves of 300 ft. to 350 ft. radius, and heights of 6,000 ft. to be attained.

The much-discussed south-north Cape to Cairo route, a distance of nearly 7,000 miles, unlike the east-west routes of the northern land hemisphere, will connect no great ocean routes; and for through traffic, with the exception of mails and passengers, will be of little importance, as the railway will, for most of its length, be paralleled by the cheaper ocean route. Its main function will be to connect a number of shorter lines coming from the eastern and western ports, which will bear the main traffic. The routes of Africa are, in several cases, water routes by river and lake, connected here and there by railways; and it seems a more practicable plan to make use of Nile and lake navigation in the Cape to Cairo scheme than to make an all-rail route. Alexandria and other delta ports have railway connections with Cairo, from whence a main line runs up the Nile valley to Aswan, break of gauge from 4 ft. 8½ in. to 3 ft. 6 in. occurring at Luxor. From Aswan to Wadi Halfa the navigable Nile replaces the railway, which, however, proceeds from that centre to the third cataract. A more important line crosses the desert to Berber (with a branch to Suakin and Port Sudan, 310 miles), and continues to Khartoum (1,250 miles from Cairo). From Khartoum a line runs to Sennar, and another proceeds from Sennar westwards to El Obeid and north-eastwards to Kassala (a new section from Gedaref to Makwar, 140 miles, was opened in 1929). Schemes have been proposed for railways to connect Khartoum with Uganda, communication being by river steamer between Khartoum and Refaj. From Cape Town the route is constructed *via* De Aar, Kimberley, Mafeking, Bulawayo, and the Victoria Falls to Bukama (2,700 miles) in the Belgian Congo. South Africa has a railway network in the making. Trunk lines proceed from Cape Town and the east coast ports into the heart of Africa. The Benguela-Beira Railway is the line projected from Benguela (Portuguese West Africa) to Beira (Portuguese East Africa), *via* Southern Belgian Congo, Rhodesia, and Mashonaland. Over 500 miles are now completed, and only about 500 miles remain to be built to connect up with the Cape to Cairo Railway at Bukama, whence there is regular train service to Beira. The completion of this line will save five to seven days on the voyage to India by the Cape, and open up the great interior of the continent.

Railways, helping to overcome the difficulties to navigation on the Congo and its tributaries, are those from Matadi to Léopoldville (250 miles), from Stanley Falls to Ponthierville (80 miles), from Kindu to Kongolo (220 miles), and from Kabalo to Albertville (170 miles). Work is proceeding on the Stanleyville-Lake Albert Railway, which will eventually connect the Congo and Nile systems of navigation; and the Matadi-Léopoldville line is being linked with Bukama. Important routes from the eastern coast into the interior, involving heavy gradients, are the French railway from Jibuti *via* Diré Dawa to Addis Ababa (500 miles), the Uganda Railway; and the Usambara and Central Railways of Tanganyika. The Uganda Railway, begun in 1895 and completed in 1903, is of metre gauge, with a length of 587 miles. It links Mombasa with Kisumu on Lake Victoria. Leaving Mombasa Island, the line reaches the mainland by the Macupa or Salisbury Bridge (1,732 ft. in length), and traverses magnificent highland and lowland scenery. Beyond Nairobi it suddenly dips into the Rift valley, after which it attains its greatest altitude (8,320 ft.) on Mau Summit, and then begins to descend to Lake Victoria (3,726 ft.), on which there is steamer traffic. The Usambara from Tanga to New Moshi (220 miles), and the Central (780 miles, formerly German) from Dar-es-Salaam through Tabora to Kigoma, near Ujiji, are the only railways of Tanganyika. Beira and Lourenço Marques are termini of railways from Rhodesia and the Transvaal. On the west Luderitz Bay and Walvis Bay are connected with the Cape railways.

In West Africa railways are complementary to river routes. Several lines from the coast penetrate the interior; and important lines connect the navigable portions of the Niger and Senegal, and Lagos with Kano (700 miles). From Fez, in Morocco, a line joins several of the coast towns, and is projected to reach the railways of Algeria and Tunis, which are chiefly coastal, but send short branches southwards into the interior. Western projections of the Egyptian railways will, eventually, reach Tunis, and thus help the completion of a northern transcontinental line.

AIR ROUTES

Transit by air is the latest development in transport. It is yet in its infancy, but its possibilities are great. There are two types of air vessels: the airship, which relies on the use of a large volume of gas to give it buoyancy and so is lighter than air; and the aeroplane, which has no gas container,

and is heavier than air. Progress so far has been made chiefly in the use of the aeroplane. Its sphere lies in the carriage of passengers, mails, and valuable goods which need either safe or rapid transit. Cole says: "Owing to the stimulus of the war on the development of aircraft of all varieties, the geography of communications has definitely risen from land and sea into the air. It is no longer merely one-dimensional as on the roads and rails, or two-dimensional as on the surface of the sea, but has now become three-dimensional as well." Air routes connect points of commercial importance; necessitate the provision of aerodromes and emergency landing grounds; follow coast-lines, waterways, rivers, and lakes; and have to face the partial barriers of mountain ranges and tropical deserts. In thickly populated regions, such as England, France, Germany, and the United States, commercial air liners provide rapid transport for mails and passengers; in thinly populated regions as in the interior of New South Wales and Queensland, they connect places not yet served by railways; and in certain regions, such as those served by the Imperial Airways route from Cairo to Karáchi, they are of commercial and strategic importance.

There are now over 100,000 miles of air routes in regular operation, of which Germany has 20,000, France 18,000, and Britain 6,500. The chief British lines are: London (Croydon) to Paris; London-Paris-Basle-Zurich; London-Ostend-Amsterdam (a Swedish line continues to Stockholm and Oslo); London-Brussels-Cologne (a German line continues to Berlin, and a German-Russian line completes the journey to Moscow); and Croydon to Galway (for speeding up the mails). It is estimated that by aeroplane or airship London could be brought within a fortnight of the farthest cities and territories of the Empire. The estimates are: London to Canada, 2½ days; to India, 5 days; to Cape Town, 6 days; to Australia, 11 days; and to New Zealand, 13 days. Another bond of union is thus a possibility. A weekly air service operates between Croydon and Karáchi and between Croydon and Capetown. The route from Croydon is by large passenger aeroplanes *via* Paris to Marseilles, then by air boats for the passage over the Mediterranean Sea to Cairo, and by aeroplanes *via* Bagdad and Basra to Karáchi. (During the winter months the route is overland as far as Athens.) Air voyages have been made round the world, across the Atlantic from both the east and west, and Australia will soon be connected by air services with Croydon. Probabilities of the future are air-routes to connect the various parts of the Empire, which will have key-points in Egypt, Cape Town, Malta, Bombay, Jamaica, Ottawa, Perth, and Sydney. Whatever may be the future development in air transport, it seems unlikely that the airship and the aeroplane will be able to compete with railways and ships for the carriage of bulky goods; but for passenger, mail, and precious goods their future is hopeful, and they will be specially helpful in time of war as another link in uniting distant countries. It is safe to say that, owing to the position of the various parts of the British Empire, Britain is bound to be the biggest commercial air power, and will be situated admirably in case of war. Egypt will be the junction of the Old World routes; Jamaica will be the hub of the New World; whilst Australia and New Zealand are as well-fitted to control the Southern Hemisphere as is England to control the routes of the North.

German air services link up all her chief cities and extend to all important European countries; and French routes connect with those of neighbouring countries, and have extensions to London, Warsaw, Istanbul, French North Africa, and French Equatorial Africa. Eventually Paris will be brought within seven days of Buenos Ayres. From Paris the most important lines are to: Toulouse, Casablanca, St. Louis (with connections to South America), and Dakar; Cologne and Berlin; Brussels; London; Basle and Zurich; Lyons, Marseilles, Algiers, and Tunis; Strasbourg, with connections to Nuremberg, Prague (Prahá), Vienna, Budapest, Belgrade, Bucharest, and Istanbul. From Berlin there are services to: Rotterdam *via* Hamburg, Bremen, and Amsterdam; Stettin and on to Stockholm; Munich *via* Halle; Zurich *via* Halle, Erfurt, and Stuttgart; Breslau; Karlsruhe *via* Halle, Erfurt, Frankfort, and Mannheim; Moscow *via* Dantzig, Königsberg, and Kovno; Memel *via* Dantzig, Königsberg, and Tilsit; Lübeck, Copenhagen, and Oslo; Cologne and Paris.

The United States has an air mileage of 60,000, connecting the east and west; Canada uses aeroplanes and hydroplanes for the detection of forest fires and for surveying, and there are several routes with regular services in the provinces; Australia connects her widely distributed towns by air services. South Africa opened her first mail service—Cape Town to Port Elizabeth—in August, 1929; and several of the great towns of South America are connected by air services.

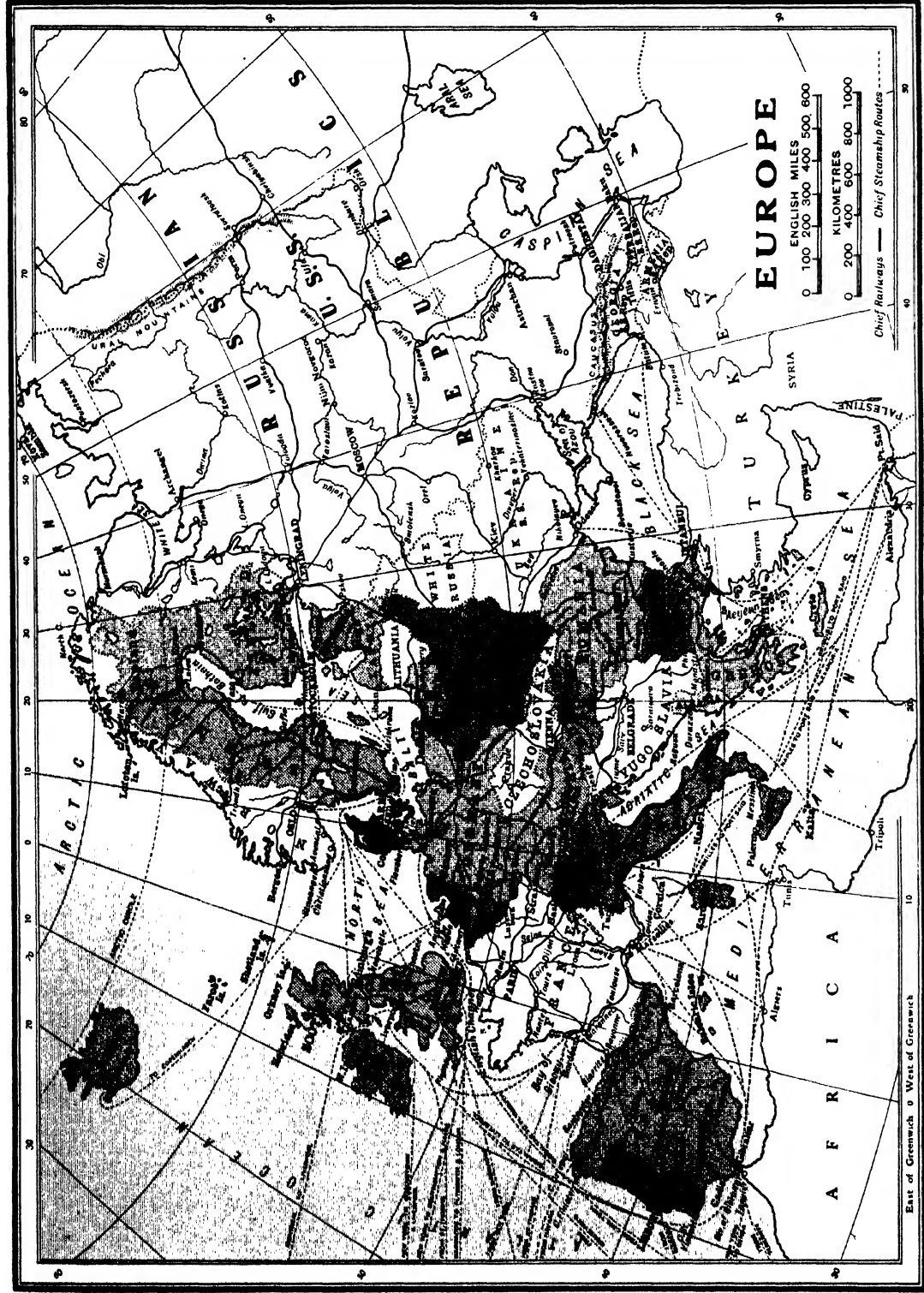
Position, Area, and Population. Europe, the continent of peninsulas, and the peninsular continent, young geologically, yet the most important politically and commercially, is, next to Australia, the smallest of the continents, but the most densely populated (total area, 3,850,000 square miles; population, 475,000,000). It is bounded by seas, except on the east, where the boundary follows the water-parting of the Ural Mountains, the Ural River, and the water-parting of the Caucasus. Although Europe is a peninsula of Eurasia, its history has, in large measure, been distinct from that of Asia. From a narrowing between the Black Sea and the Baltic, Central and Western Europe form a peninsula from which smaller peninsulas project, Jutland to the north, Iberia, Italia, and Balkania to the south, while Scandinavia is true to the West European type. The mass or central core of the continent narrows from east to west. It is nearly 1,500 miles from the Caspian Sea to the Arctic Ocean along the meridian, over 600 miles from the Adriatic to the North Sea, and 230 miles from the Mediterranean Sea to the Bay of Biscay. The White, Baltic, and North Seas are the chief northern seas, and the western Mediterranean between Iberia and Africa, the eastern Mediterranean with the gulf of the Adriatic, the Aegean and the Black Seas, are the southern seas. Of these seas the northern cover the shallow continental platform, but the southern are basins of great depth. Neglecting minor indentations, the coast line of Europe is about 20,000 miles, and is longer in proportion to area than that of any other continent. Central position in the land hemisphere, peninsular aspect, extensive coasts, numerous gateways of commerce, and closeness to the sea, have led to Europe's supremacy in shipping, and its latest dream of a ship-canal across its centre.

Races. Three European races are distinguished: the Nordic, the Central or Alpine, and the Mediterranean. The Nordic people, tall, long-headed, fair-skinned, and blue-eyed, evolved around the shores of the North Sea. Originally fishermen and mariners, they learned in their struggle with the bleak climate of their northern home the virtues of indomitable courage, bold adventure, and justice between man and man. They occupy Scandinavia, Denmark, the plains south of the Baltic Sea as far east as the country round the Gulf of Riga, and most of the lowlands around the North Sea and the English Channel; and by their initiative and prowess they largely dominate the world. The Mediterranean people, short, long-headed, olive-complexioned, with very dark hair and eyes, arrived in Europe mainly by sea, from Asia Minor, the Levant, and North Africa. Living under easier conditions than the Nordics, they evolved the first European civilization. Intolerant of severe cold, mercurial in temperament, sociable, prone to quarrel and take revenge, guided by feelings rather than reason, with musical and poetical gifts, they lack the courage, energy, and organizing powers of the Nordics, and the plodding industry of the Alpines. They occupy Iberia, Italia, and the adjoining islands. The Alpine people, fair-skinned, broad-skulled, stocky, brown-haired, hazel-eyed, pressed westwards from Asiatic pasturelands, and made good their hold on the uplands of Central Europe. They were the first workers in bronze, and to them is due much of the

superiority of European workmanship. Doggedness, attention to details, and submission to leadership are their dominant characteristics. They occupy the uplands and highlands in France, Switzerland, Italy, Germany, and Austria, the steppes and pasturelands in Russia, and in parts have extended into the country on either side.

Relief. More than half the surface of Europe lies below 600 ft., so that the proportion of lowland is greater than in any other continent, and yet the greatest variety in relief is found. The north-western lands, including Finland, Scandinavia, the northern half of Scotland, and the north-west of Ireland, consist of old earth-blocks, the worn-down stumps of ancient mountains, scarred and hollowed by the glaciers of the Ice Age, and diversified by lake and fell, moorland and forest, stream and waterfall. Rarely containing much mineral wealth, with soils unfavourable to agriculture, these lands force their inhabitants to turn to the sea for highway and opportunity. Giant earth forces raised an east-west system of mountains along lat. 50° N., known as the old Armorican and Variscan mountains, existing to-day as the heights of South Ireland, South Wales, Cornwall, Devon, Brittany, the Ardennes, Eifel, Vosges, Taurus, Hunsrück, Harz, Black Forest, Ore Mountains, Giant Mountains, and Sudetes. Other ancient earth-blocks ("coigns") are the Meseta or main plateau of Spain, the Central Massif of France, the plateau of Bohemia, the Russian platform, and the Aegean plateau. Between the relics of ancient Arctis in the north and the later old mountains lies the Great European Plain, a region of sedimentary rocks under 700 ft. high, stretching from the Pyrenees and the western mountains of the British Isles to the Russian Urals. It has experienced the tropical jungle climate of the carboniferous period (hence its coal), the torrid dryness of triassic times, and the Arctic conditions of the Ice Age. Lying open to the Atlantic winds and allowing easy communication, this lowland encourages intercourse and agriculture, and has become the home of some of the world's most energetic workers. Other plains are the fertile basins of Hungary, Lombardy, and Wallachia. Sweeping complex high-folded mountains of the Alpine system, part of the great east-west system which extends across the south of Eurasia from the Pyrenees and Sierra Nevada to the Himalayas are characteristic of South Europe. They include the Sierra Nevada, the Pyrenees, the Alps, the Apennines, the Tatra, the Carpathians, the Balkans, and the Caucasus. Within the folds of the sinuosities are the youngest lands of Europe, the Alföld of Hungary, and the Lombardy Plain, hollows filled with the off-scourings of the Alps.

Rivers. The chief commercial rivers of Europe are the Rhine (760 miles), the Danube (1,740 miles), and the Volga (2,300 miles). The Rhine, the principal waterway of Western Europe, springs from the Alpine glaciers of Mt. St. Gotthard at an elevation of about 7,600 ft. It descends rapidly to Lake Constance (1,250 ft.), thence through the falls to Basle (800 ft.), and then flows, with a navigable course, through the Middle Rhine Plain, the Rhine Rift Valley between the Vosges and Schwarz Wald, the Rhine Gorge from Mainz to Coblenz, and Holland to the North Sea. Its principal tributaries are the Aar, Moselle, and Maas on the left bank, and the



EUROPE

ENGLISH MILES
0 100 200 300 400 500 600
KILOMETRES
0 200 400 600 800 1000

Chief Railways — Chief Steamship routes - - - - -

East of Greenwich 0 West of Greenwich

Neckar, Main, Lahn, and Ruhr on the right bank. Controlled now by an International Commission, the Rhine deals specifically with foreign trade. Cologne is reached by light-draught sea-going vessels, and tugs and barges use the river as far as Basle, 500 miles from its mouth. The Elbe and the Oder, international waterways, are both navigable for long distances; the former to Prague (Praha) in Czechoslovakia, the latter to Kosel in Silesia. There is canal connection between the two rivers, and the Czechoslovak Government intends to connect the Danube and the Elbe to form a continuous waterway through their country from Hamburg to the Black Sea. The Rhone (507 miles) rises among the Alps at an elevation of 6,000 ft., and is one of the most rapid rivers of Europe. It is joined by the Saône, a first-class waterway, at Lyons, and then flows to the Gulf of Lions, which it enters through a delta, of little use for navigation. At present the Rhone carries less than a million tons of merchandise per year, but promises greater importance when the Lyons-Marseilles canal is made. The Danube, an international waterway, rises in the Black Forest at an elevation of nearly 3,000 ft. It flows through an Alpine country to Ulm, and thence to Passau, the upper limit of steam navigation. From Passau to Vienna it runs through a second hilly region, but the remainder of its course is through a flat country, except on approaching the rocky defile of the "Iron Gates," where, however, the rocks have been blasted, and the bed of the river canalized. The river, finally, enters the Black Sea by three main mouths. Its three chief navigable tributaries are the Theiss, Drave, and Save. Though suffering from ice in winter, floods in spring and summer, and its flow through shallow gorges and in the wrong direction (west to east), the middle and lower courses of the Danube are really important for traffic, and the bulk of the grain exports of Hungary and Rumania are carried on its waters. The Volga, which rises in the Valdai Hills, at an elevation of 550 ft., flows slowly in a long and winding course to the Caspian Sea, which is 85 ft. below the level of the Black Sea. It has the disadvantages of being frozen over for half the year, varying volume, and wrong direction of flow. Its importance to Russia, however, is great. Together with its navigable tributaries, the Kama and the Oka, it carries most of the grain, oil, and salt, and 37 per cent of the timber. Other rivers are the Tagus and Ebro of Iberia; the Garonne, Loire, and Seine of France; the Thames of England; the Vistula of Poland; the Dniester, Don, and Dnieper of Russia; the Po of Italy; and the Scandinavian rivers used chiefly for water-power and the floating of timber.

Most of the lakes of Europe lie in hollows in the plateaux, or in valleys in the mountains, carved and dammed by glaciers and their debris. They include the plateau lakes of Finland, Russia, and South Sweden (Ladoga, Onega, Peipus, Wener, Wetter, and Malar); the small lakes on the north of the German plain, the Scottish lochs, the burns of the High Tatra, and the beautiful Alpine lakes (Maggiore, Lugano, Como, Garda, Geneva, Zürich, Constance, Lucerne, and Neuchâtel).

Climate. Maritime Western Europe possesses a climate of small changes and infinite variety, the best suited to human initiative and energy. It enjoys the Winter Gulf of Warmth (January tem-

peratures are 40° F. above the normal for the latitude) owing to its marginal seas, the warm drifted surface waters of the ocean, and a continuous succession of cyclones. Europe occupies an essentially transitional position, west of the world's vastest land mass, and east of the great Atlantic Ocean. Peninsularity, direction of mountains, marginal seas, and the chief winds make it that no equal area in similar latitudes elsewhere has such an equable climate, nor is so markedly transitional. From south to north the temperature diminishes, in winter also from west to east, but in summer from east to west. The winds are governed by three centres of atmospheric action: a permanent low pressure to the north-west in the North Atlantic; a permanent high pressure, west of the Azores; and the Asiatic high-pressure centre of winter, and low-pressure centre of summer. The Icelandic Low and the Azores High direct south-west winds on the west coasts, but the Continental High of winter permits these to skirt only the coasts, while the Continental Low of summer sucks them inland. The west is stormy and rainy in winter; the east is dry in winter, but has summer rains. The Mediterranean Sea is not much smaller in area than the land immediately north of it, and affects the climate, forming a relatively low-pressure area in winter, and a relatively high-pressure area in summer; so that the winter storms, which the Continental High keeps out of the heart of Europe, find their way into the Mediterranean, and the rainy winds, which reach Central and Eastern Europe in summer, cannot penetrate the Mediterranean.

Four climatic regions may be distinguished. The North or Arctic Region comprises a small northern coastal strip from the North Cape to the Kara Sea, where the mean monthly temperature is never 50° F. The West or Atlantic Region comprises, roughly, the area north and west of a line from the mouth of the Minho through the Cevennes and the crest of the Western Alps, and from the south-west of Bohemia to the mouth of the Oder and the south and west coasts of Scandinavia. It is specially marked by even temperature, the mean temperature seldom falling below 32° F. for more than one month in the year, and seldom rising above 64° F. for more than one month. Rain falls at all seasons of the year, but especially in the winter months, and cyclonic storms and frequent small changes in temperature and rainfall favour man's highest development. The Eastern or Continental Region is specially marked by extremes of temperature, at least three consecutive months averaging below 32° F., and at least three averaging above 64° F. The annual range of temperature is over 40° F., and the rainfall (mostly in the summer months) is scanty, very little having 30 in., and much of it less than 20 in. The Southern or Mediterranean Region is specially marked by the absence of continuous frosts, except on the high mountains, 50° F. being a typical winter temperature alike in Valencia, Corsica, Calabria, and Crete, and by the absence of summer rains, except along the northern heights, which exclude the bitter north winds in winter. The range of temperature is, with few exceptions, under 30° F. The rainfall is heavy in the highlands, but light in the lowlands, and occurs in the winter half-year.

Vegetation. The tundra lies north of the Arctic Circle and east of the White Sea, and is found in the



PRODUCT MAP
OF
EUROPE.
Scale: 470 miles to the Inch.

Kola peninsula and the high mountain regions of Scandinavia. In the north of the Baltic region, and in the north-east of the eastern lowlands, north of a line from the Gulf of Finland to the south of the Urals, the land is covered with almost continuous forests of conifers, interspersed in the north-east with birch and willow. Southwards, the lowlands have been almost entirely cleared, except in the region below the Dnieper, the Western Dvina, and the Vistula, where forests of mixed coniferous and deciduous trees still exist. The vegetation of Western Europe differs from that of Central Europe in its park-like appearance of wood and valley meadows, its tender green foliage approaching evergreenness, its longer leafy stage, and, on its Atlantic fringe, in the luxuriant growth of native and imported evergreens, such as the holly, yew, cherry laurel, and Portuguese laurel. In the South-eastern Lowlands—South Russia, Rumania, and Hungary—where the continental climate prevails, are the dry monotonous grasslands, known as the Steppes, part of which is under cultivation, but most is treeless grassland, a land of wells, cattle, and nomads. South-east of the Steppes is a salt waste. The Mediterranean Vegetation Region coincides with the climatic one. It is characterized by evergreen or evergrey plants with thick epidermis or cuticle, long or bulbous roots, and special devices for storing water. Cork oak, myrtle, olive, carob, orange, terebinth, fig, and rosemary are typical trees. Narrow-leaved heaths and sweet-smelling herbs are numerous; fruits, such as grapes, lemons, oranges, plums, apricots, pomegranates, figs, pears, peaches, filberts, and butternuts reach perfection; but pasture is generally sparse, except at great elevations.

Economic Conditions. Europe, and especially Western Europe, is the most highly developed continent in mining, agriculture, fishing, manufactures, commerce, and social conditions. The Western European lands are favoured with a climate best suited to human energy, great mineral resources, excellent transportation systems, ideal position for trade, and people, largely of Nordic stock, initiators in industry and democratic government. Britain leads in manufactures, commerce, and colonization; France in romantic thought and artistic taste; and Germany in technical research. Agriculture is highly scientific, both in dairying and crop-growing, and manufactures and commerce have reached the greatest development yet known. Their natural resources, however, are gradually being used up, notably in Britain, and much raw material has to be imported. The future seems to lie in the human element becoming perfectly trained, technically and intellectually.

The tundra dwellers obtain a precarious living by hunting and fishing. With the aid of dog and reindeer they wander northwards in summer to the meagre pastures, and southwards in winter to the forests. In the great pine forests the fur-bearing marten, fox, ermine, sable, musk-rat, mink, otter, and beaver are hunted, and the waterways allow the transport of timber, resin, and tar. The water-power of the Scandinavian rivers is utilized for preparing the timber, and for match-making, wood-pulp production, electricity production, and paper-making.

The bulk of the people of Europe are engaged in agriculture. Land hunger is universal, and intensive scientific farming, the result of changeable weather

and dense population, is the rule in Western Europe, where small-holdings are very successful, and dairying has reached its highest perfection. Europe produces about half the world's wheat, oats, and barley, and nearly all the rye; and has a third of the world's horses and sheep, nearly half the pigs, and about a quarter of the cattle. In the extreme north, in the clearings of the forest region, and in the southern Alpine lands, barley is the most important crop. Oats are grown chiefly on the hilly lands between 50° and 65° N. Lat., and are replaced by rye on the lowlands of the mainland between 50° and 60° N. Lat. Most wheat is grown between 40° and 52° N. Lat. The maize zone lies between 40° and 50° N. Lat. Some rice is grown in the Lombardy Plain, round the Bay of Naples, in southern Sicily, and on the deltas of the Mediterranean rivers. Pulses and potatoes are widely cultivated, the latter especially in the poorer lands of Ireland, Scandinavia, and the German plain. The sugar-beet, important between 40° and 58° N. Lat., and in the Danube lands, yields more than one-third of the world's sugar. Flax is raised in the Baltic lands, Central Europe, the Rhine delta, Belgium, and north-eastern Ireland. Hemp is cultivated in France, Italy, Austria, and Southern Russia. Tobacco is important in many localities south of 55° N. Lat. The Mediterranean area produces great quantities of southern fruits, and formerly held a monopoly, but has now to face the competition of other "Mediterranean" areas. The vine is widely grown in France, Italy, Spain, Portugal, the Rhine plain, and Hungary, and Europe leads the world in wine production. Horses are found all over Europe, and mules and donkeys are numerous in the Mediterranean region. Sheep predominate in the drier and cattle in the wetter areas. Goats are numerous in the south.

Fish—cod, herring, haddock, whiting, mackerel, sole, and plaice—abound on the Atlantic shelf; the tunny, anchovy, and sardine are numerous in the Mediterranean Sea; and fresh-water salmon, sturgeon, and trout are important. To the fishing industry Europe owes much of its freedom and world outlook. Most important are the marine fisheries (the first in the world), located in the North Sea and off the Norwegian coast, where fish accumulate owing to the abundant food and favourable environment. Of less value are the Mediterranean and river fisheries.

The mineral wealth is very great, the continent producing half the world's coal, iron ore, pig-iron, and steel. Far the most important mineral arrangement in Europe is the line of coal-fields lying mainly on the northern border of the Armorican and Variscan Highlands. Included in this line are the coal-fields of Great Britain; Asturias in Northern Spain; St. Etienne and Creusot in France; the Saar; Flanders in both France and Belgium; Westphalia, Saxony, and Lower Silesia in Germany; Czechoslovakia; Poland; and Bulgaria. Other large coal areas are found in the south of Moscow; north of the Sea of Ozov; along the Donetz valley; in the west of the Urals; in eastern Spain, to the north of Valencia; and in Spitsbergen. Lignite is found and utilized in Hanover, Czechoslovakia, Austria, Hungary, Rumania, and Yugoslavia. Petroleum is worked in Azerbaijan, Rumania, and Poland, in regions fringing the Alpine system. Iron ore exists

in the secondary rocks from N.E. Yorkshire into Northamptonshire, in Furness, Luxemburg, Lorraine, the Sierra Morena and Cantabrian Mountains, round the Central Massif of France, in the east and north of Scandinavia, in Finland, Spitsbergen, Saxony, Czechoslovakia, Silesia, Poland, Austria, Southern Russia, Belgium, Westphalia, and Elba. Copper is obtained in Southern Spain, the Harz Mountains, Sweden, Italy, Russia, Jugoslavia, and France. Zinc occurs in Upper Silesia, Poland, Sweden, Belgium, France, Spain, Britain, and Germany. Lead is mined in South Spain, the Harz Mountains, Saxony, Upper Silesia, Austria, and Poland. Bauxite is produced in Southern France and Northern Ireland. Gold and silver, in small quantities, are found in the Urals, the Harz Mountains, the Erzgebirge, and Hungary. Mercury is obtained from the Sierra Morena, and the Urals contain the world's largest supply of platinum. Tungsten is mined in Portugal; manganese in Russia, Austria and Sweden; and sulphur in the volcanic districts of Naples and Messina. Salt is found in England, France, Poland, Austria, Czechoslovakia, Spain, Switzerland, Bulgaria, and Germany; and large deposits of potash salts at Stassfurt help to make Germany supreme in the chemical trade.

Manufactures have reached their greatest development in Britain, Germany, France, Italy, Belgium, Czechoslovakia, Austria, and Poland, and Russia is making great efforts to increase its manufacturing strength. Britain has a high reputation for fair dealing, and for goods of superior quality and durability. France specializes in textile and metallic work that calls for individual taste and thought as regards form, arrangement, and colour; Germany is the leader in the application of science to mass production, and is pre-eminent in the chemical and dyestuffs industries. Water-power is used as a sub-

stitute for coal in Norway, Sweden, Switzerland, Czechoslovakia, Northern Italy, Austria, South-eastern France, and Southern Germany.

For more than two centuries Europe has exported its human freight to people the vacant spaces of the New World; its capital, banking system, organization, and commerce, aid the whole world; and much of Africa, a fairly high percentage of Asia, a large part of North America, and the whole of Australasia, are, to a greater or less extent, under the control of European nations.

Gibraltar is a fortified rocky promontory, projecting into the Mediterranean from the south of Spain. The town of the same name is situated on a bay to the west of the fortress, and is a British coaling station as well as a place of call for ships passing through the adjacent strait. An enclosed harbour, with three graving docks capable of accommodating the largest battleships of the British Navy, has been built at a cost of over four millions sterling. The garrison numbers about 6,000 men. Between 5,000 and 6,000 vessels call at Gibraltar annually, and there is a large trade in ships' stores and luxury articles for travellers.

Malta, a British naval, coaling, and supply station, is the largest island of a group of three principal and many small ones, situated about 60 miles south of Sicily, having numerous safe harbours. The population, mainly of Arabic descent, numbers 242,000. Valetta, the chief town, is, for half the year, the station of the British Mediterranean fleet. It is strongly fortified, and its garrison is nearly twice as strong as that of Gibraltar. The colony includes the adjoining islands of Gozo and Comino, as well as several islets, all of which are densely populated and highly cultivated. The chief economic products are corn, oranges, melons, grapes, cummin-seed, onions, figs, tomatoes, and early potatoes.

Position, Area, and Population. England and Wales occupy the southern and larger portion of the continental island of Great Britain, lying on the Atlantic border of Northern Europe. England has an area of about 50,874 square miles, and its population at the last census in 1931 was 37,789,738. Its high average density (over 700 to the square mile) is largely accounted for by its great mineral wealth, and the position the country has reached in industry and commerce. The area of Wales is approximately 7,466 square miles, and its population in 1931 was 2,158,193. The comparatively low average density (289 to the square mile) is mainly due to the mountainous nature of the country, which is adverse to agriculture and easy communication. In 1891, 72 per cent of the people in England and Wales were urban, and 28 per cent rural; in 1931 the figures were 80 and 20 respectively.

Coast Line. The coast line of England and Wales (about 3,000 miles) is remarkably long for so small an area, comparing most favourably with the coast lines of other great maritime countries, and giving to the British great aid in their commerce. The western coast is rocky and mountainous, and contains many drowned valleys, which form splendid natural harbours. Lack of productive hinterlands, however, hinder the rise of several small Welsh ports. The chief harbours, Liverpool and Bristol, are situated on the flat lands, where communication with the interior is easy. Both face America, and trade largely with that continent. On the east coast, Hull, on the Humber, and London, on the Thames estuary, are excellently situated for trade; but good harbours are few on this coast owing to the long, low, sandy reaches. There are many good harbours on the south coast, such as Portsmouth Harbour, Southampton Water, Plymouth, and Falmouth. The great back-to-back estuaries (the Mersey-Humber and the Severn-Thames) ensure that no interior point is more than 70 miles from the sea.

Relief. North-west of a line drawn from the Exe to Whitby lie the true mountainous regions of England and Wales, and the mountains of old formations. In the extreme north the volcanic Cheviot Hills are separated from the Pennine Plateau by the Tyne Gap. Southward to the Vale of Trent the Pennine barrier extends for about 120 miles, flanked by plains, and attached by Shap Fell to the picturesque Cumbrian Group in the north-west. In the south-west the Cornwall and Devon Highlands lie close to the west coast, while central and south-eastern England display alternate belts of plain and low ridge, of varied "young" formations—*lias*, limestone, and chalk. Wales is essentially a dissected plateau, difficult of access, an environment favourable to independence and the preservation of a native language and customs. Fertility of the soil increases with ease of access to Europe, and richness in mineral wealth with ease of access to the Atlantic.

Climate. The climate is more equable than the climates of countries in the same latitudes on the European mainland. No great extremes of temperature occur, no areas lack sufficient moisture for ordinary agricultural pursuits, but everywhere the oceanic climate encourages industry, and promotes a virile race. The peninsula lies in the track of the moist westerly Atlantic winds, which, meeting moun-

tain barriers on the west, are deflected upwards. The consequent expansion of the air results in cooling, which leads to the deposition of a heavier rainfall on the western area than on the eastern, where compression in descending increases the vapour-holding capacity of the air. Around Snowdon the annual rainfall is about 200 in.; in the Lake District 60 in. to 80 in.; in Wales from 40 in. to 60 in.; and in Lancashire from 30 in. to 40 in. Over most of the English Plain the annual rainfall averages 25 in. to 31 in.; though an area round the Wash and a part of Essex receives a fall of 20 in. to 25 in. only. The western areas have the more equable temperatures (January, 44° F.; July, 61° F.); the eastern experience more continental characteristics (January, 38° F.; July, 62° F.). Drier air, warmer summers, and suitability of soils make the eastern region agricultural, while the wetter west is pastoral.

Land and Water Routes. Means of communication, external and internal, are excellent. Roads are well made and kept; river navigation has been improved by canalization; a network of canals exists, especially in the Midlands; railways branch in all directions connecting every district, and showing a great density when compared with the networks of other commercial countries; and postal, telegraphic, aerial, and telephone communications are very complete. Motor traffic on the roads has developed to an extraordinary extent, and roads are now almost regaining the relative importance they held in the coaching days of over a century ago. (For air traffic see page 15.) Commercially, the most important rivers are the Thames, the Mersey, the Yorkshire Ouse, the Severn, the Tyne, the Wear, the Tees, and the subsequent Trent.

Railway Groups. Prior to 1st January, 1923, the English and Welsh lines (some 16,200 miles) were worked by twenty-seven companies, but on that date they were organized into four great groups for more economical and effective working—

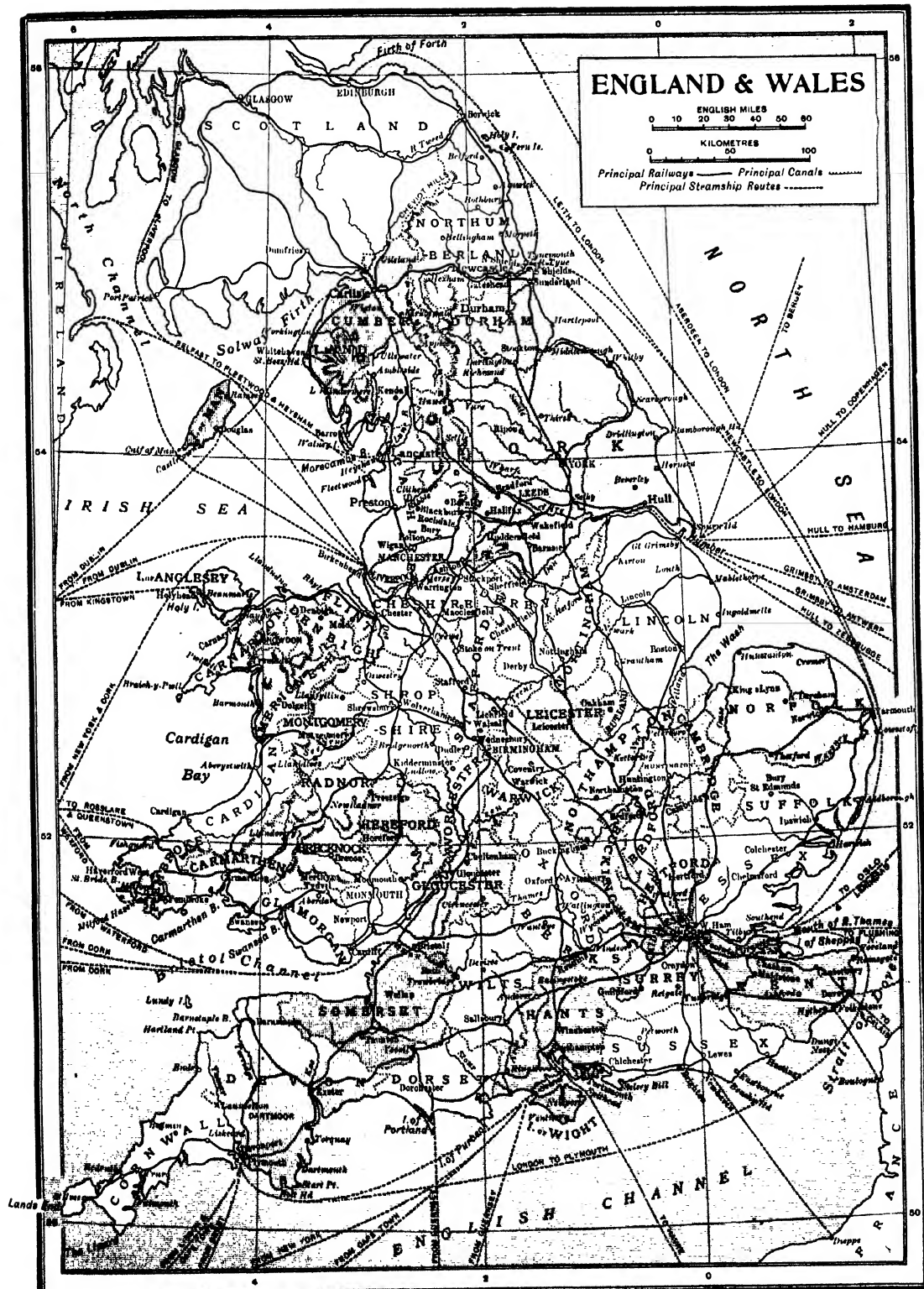
(1) The London, Midland and Scottish Railway (7,464 miles), which absorbed thirty-five railway lines, the chief being the London and North-Western; the Midland; the Lancashire and Yorkshire; the Furness; the Caledonian; the Glasgow and South-Western; the Highland; the North London; and the North Staffordshire lines. Its headquarters are at Euston.

(2) The London and North-Eastern Railway (6,464 miles), which absorbed thirty-one railway lines, the chief being the Great Eastern; the North-Eastern; the Great Central; the Great Northern; the North British; the Great North of Scotland; and the West Highland lines. Its headquarters are at King's Cross.

(3) The Great Western Railway (3,765 miles), which absorbed the numerous Welsh railways, the chief being the Barry; the Cambrian; the Rhymney; and the Taff Vale lines. Its headquarters are at Paddington.

(4) The Southern Railway (2,129 miles), which absorbed the London and South-Western; the South-Eastern and Chatham; the London, Brighton, and South Coast together with fifteen smaller lines. Its headquarters are at Waterloo and London Bridge.

London, from which radiate nine trunk lines, is the natural route centre of the most important railways, all of which are the growth of the last



hundred years. The London, Midland and Scottish Railway links London with Carlisle, and serves the Midlands and the Industrial North. Two principal routes traverse the Midland Plain. The more easterly, the former Midland route, runs from London (St. Pancras) through St. Albans, Luton, Bedford, Kettering, Leicester, Trent Junction (branches to Nottingham, Lincoln, Derby, Manchester, and Liverpool), Chesterfield, Sheffield, Normanton, Leeds, the Aire Gap, Settle, and Appleby to Carlisle. The West Coast route (former London and North-Western) runs from London (Euston Station) through Northampton, Rugby (branch to Stafford), Lichfield, Stafford, Crewe (branches to Holyhead—North Wales and Irish traffic—Manchester, Liverpool, Leeds, Shrewsbury, Cardiff, and Swansea), Warrington, Wigan, Preston, Lancaster, Shap Fell, and Penrith to Carlisle. Other important lines of the L.M. & S.R. are the old Lancashire and Yorkshire routes connecting Liverpool, Manchester, and Goole; and the route from Birmingham through Gloucester, Bristol, and Bath to Bournemouth. The London and North-Eastern Railway serves the flat lands of East Anglia, part of Central England, the eastern portion of the Industrial North, and links London with Berwick-on-Tweed. Two main lines radiate from London (Liverpool Street) into East Anglia: (1) the eastern or coastal line, passing through Chelmsford, Colchester, Manningtree Junction (branch to Harwich—continental traffic), Ipswich (branch to Norwich), Beccles (branch to Lowestoft) to Yarmouth; and (2) the more inland line, through Cambridge, Ely (branches to Hunstanton and Norwich), March (branch to Peterborough), and Lincoln to Doncaster. From King's Cross (London), its most important route to the north is the famous East Coast route, which traverses the English Plain through Barnet, Huntingdon, Peterborough, Grantham and Retford (branch to Liverpool) to Doncaster, beyond which it enters the Plain of York, sending branches to the West Yorkshire towns and running through York to reach the coastal plain at Darlington. From Darlington the line crosses the Durham plain to Newcastle (branch by the Tyne gap to Carlisle) and Berwick. The former Great Central route runs north from London (Marylebone) through Aylesbury, Rugby, Leicester, Loughborough, and Nottingham to Sheffield, where it divides to reach the east coast at Grimsby, and the west coast through Manchester. The Great Western Railway serves the area lying between the two lines—London-Chester, and London-Penzance. One line runs north-westwards from London (Paddington) by High Wycombe, Warwick, Birmingham, Shrewsbury (branches through Wales and the Severn Valley), Wrexham, and Chester to Birkenhead; another main line proceeds through Reading, Didcot, Swindon, the Severn Tunnel (4½ miles), Newport, and Cardiff to Fishguard (Atlantic passenger traffic, and Irish); and a third main line runs through Reading, Newbury, Westbury, Castle Cary (branch to Weymouth), Taunton, Exeter, Plymouth, and Truro to Penzance. This last route is connected with the other two by a line from Taunton through Bristol, Gloucester, and Cheltenham to Birmingham. The Southern Railway links London with the cross-channel ports of Dover, Folkestone, Newhaven, Weymouth, and Southampton; the naval stations of Chatham, Devonport, and Ports-

mouth; the military station of Aldershot; and the holiday resorts of the south-east, south, and south-west. A main line runs from Waterloo (London) through Woking (branch to Portsmouth), Basingstoke (branch to Winchester and Southampton), Salisbury (branch to Weymouth, Poole, and Dorchester), Yeovil Junction, and Exeter, whence lines reach the coastal resorts of North Devon, mid-Cornwall, and Plymouth. From London Bridge and Victoria stations (London) main lines connect the metropolis with Newhaven, Portsmouth, and Hastings; from Charing Cross and London Bridge stations a line proceeds through Tonbridge, Ashford, and Folkestone to Dover; and from Victoria, Holborn Viaduct, and St. Paul's stations another runs through Chatham, Sittingbourne (branch to Sheerness and Queenborough), Faversham, and Canterbury to Dover.

There are nearly 2,000 miles of navigable rivers and 3,641 miles of canal, which carry annually more than 40,000,000 tons of minerals, chemicals, and general merchandise. The oldest canal in England is the Foss Dyke, from the Trent to the Witham at Lincoln, constructed by the Romans. Modern canals date from the opening of the Bridgewater Canal in 1761, and their network is densest in the flat Midlands and industrial Lancashire and Yorkshire. It is possible for barges to cross England from east to west and from north-west to south-east by means of the canalized rivers and the canals. The Severn is navigable for boats of 250 tons to Worcester, the Thames for boats of 120 tons to Oxford, and the Trent for boats of 200 tons to Gainsborough. It has been proposed to make the Severn navigable to Stourport for 600-ton boats, and the Trent to Nottingham for 200-ton boats, and to improve the canals from Birmingham to the four great estuaries (Mersey, Humber, Severn, and Thames) by a system of canals capable of passing barges of 100 tons. (For the Manchester Ship Canal, see page 6.) Gloucester is joined to the navigable part of the Severn by the Gloucester and Berkeley Ship Canal. Other canals are the Lancaster, connecting Preston with Lancaster and Kendal; the Leeds and Liverpool; the Aire and Calder, connecting Goole with Leeds; the Grand Junction, stretching from the Trent to the Thames; the Trent and Mersey; the Shropshire Union, connecting the Severn and the Dee with Birmingham; the Thames and Severn; the Kennet-Avon; the Oxford; the Great Western, connecting Bridgwater with Tiverton; the Bude and Launceston; the Wey and Arun; the Bedford River; the Royal Military (Rye to Hythe); and the Bridgewater.

Important cross-channel routes are: Dover to Calais (22 miles); Folkestone to Boulogne (26 miles); Newhaven to Dieppe (67 miles) and Honfleur (86 miles); Southampton to Havre (114 miles), St. Malo, Cherbourg, and the Channel Islands; and Weymouth to the Channel Islands. The chief North Sea routes are Hull to Stavanger, Bergen, Copenhagen, Hamburg, Rotterdam, Antwerp, and Zeebrugge; Newcastle to Bergen, Copenhagen, and Hamburg; Harwich to the Hook of Holland, Rotterdam, and Antwerp; Queenborough and Folkestone to Flushing; and Dover to Ostend. To Ireland the chief routes are Bristol to Cork (228 miles) and Waterford; Fishguard to Rosslare; Holyhead to Dublin (61 miles) and Greenore (70



miles); and Liverpool to Dublin (121 miles) and Belfast. Liverpool, Barrow, Fleetwood, and Heysham maintain communication with Douglas (Isle of Man). Of the great ports, Liverpool, facing the New World, has great American and Irish trade; Bristol's trade is Irish and West Indian; London is the world's chief seaport and has a large entrepôt trade. Southampton trades with the Mediterranean, South Africa, and the Far East; and Cardiff, Newcastle, and Blyth are the great coal ports.

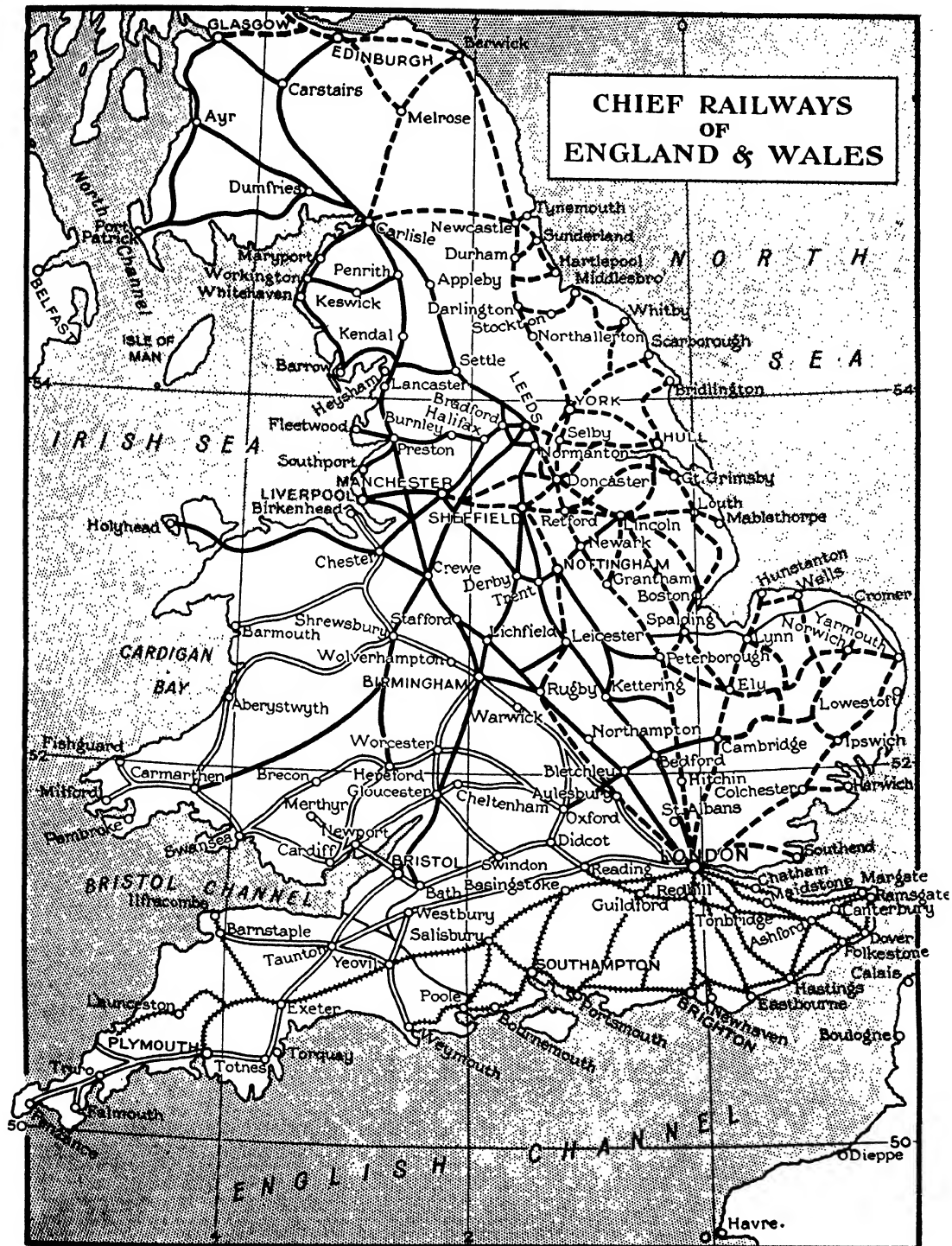
Production and Industries. *Agriculture.* Judged by the number of workers engaged in it, agriculture is still the leading single industry. Highly scientific mixed intensive farming is, obviously, a necessary and marked feature of English agriculture. To-day, however, English farmers have to face the competition of "new" countries employing extensive cultivation, and this has caused, during the last sixty years, the passage of thousands of acres of ploughed land into pasture. Salvation of the industry lies in science, and the vigour, initiative, and adaptability of the farmers. Nearly one-third of England is arable land, but Wales has less than 18 per cent devoted to cultivation. Wheat thrives best in the clayey loams of the east, notably in the Lower Thames Valley, Essex, Norfolk, Suffolk, Lincolnshire, Cambridge, and the Vale of York. The acreage is about 1,400,000, and the yield is high (30 to 35 bushels per acre). Only about one-fifth of the wheat and less than one-third of all the foods required are home-grown. Oats (1,800,000 acres) flourish under a cooler and moister climate than wheat, and are grown chiefly in the north-east, south-east, and south-west. Barley (1,200,000 acres) is chiefly produced in East Anglia, the Midlands, and the north-east. The cultivated area under rye and maize (grown for green fodder) is almost negligible. Peas and beans grow well in the Fen district, East Anglia, and the Midlands; potatoes (490,000 acres) flourish in the moist west, but reach their greatest perfection in the east; sugar-beet (175,000 acres) is grown successfully in East Anglia, and the plains of Lancashire and Yorkshire; root crops (for winter feed, 1,020,000 acres), grown widely, yield best in the east; and hay (6,100,000 acres) is the characteristic crop of all South Britain. Minor crops are: hops, produced mainly in Kent (more than one-half), Hereford, Sussex, Worcester, and Surrey; mustard in East Anglia; and celery in South Lincolnshire and the Fen district. Near all the large towns there are stretches of "market gardens." Early fruit, vegetables, and flowers reach London and other centres from mild south-western England, the Scilly Isles, and the Channel Isles. Kent, with over half the orchards, produces strawberries, cherries, apples, pears, and plums. Hampshire, Cambridgeshire, Cheshire, and Yorkshire are noted for their strawberries; and Hertfordshire, Bedford, and Buckinghamshire produce large quantities of apples and plums. The belt of country from Hereford, through Gloucester and Somerset into Devonshire, is celebrated for its apples and pears, from which are obtained the famous cider and perry of the west.

Pasture grass attains its greatest luxuriance, lusciousness, and tenderness in the western wet lowlands, which specialize in dairy cattle. In England 48 per cent of the land area, and in Wales 65 per cent are devoted to grazing. Cattle number

over 6,000,000. In the west they are bred mainly for milk; in the east and north for their beef. The most noted dairy types are the Holstein, Jersey, and Guernsey; the best beef types are the Hereford and Devon; while the Red Poll, South Devon, Welsh black, dual type of Shorthorn, and Longhorn serve the double purpose of milk and beef. Noted cattle districts are the south-west peninsula, Pembroke, Anglesey, Carnarvon, Carmarthen, and the lowlands of Cheshire, Hereford, Lancashire, Yorkshire, Derbyshire, Staffordshire, and Leicestershire. On the clays of Somerset and Gloucester, and on the red horseshoe plain of the English Midlands, the finest cheese (Cheddar, Double Gloucester, Cheshire, and Stilton) is produced. In the vicinity of the great industrial centres the dairy farmer specializes in milk and eggs; in the remoter districts he confines himself to butter and cheese. Horses (1,040,000) are largely reared in the drier parts of western and northern England; and small mountain and moorland ponies are bred in the highlands of Wales, Exmoor, Dartmoor, and the New Forest. Sheep, of prime importance to England in the Middle Ages, when wool was the chief export, even now number over 16,000,000. They flourish on all the uplands, those on the drier east yielding usually the better wool (10 lb. to 12 lb. per fleece), and on the wetter west the better mutton. Famous breeds are the long-woolled Leicester, Lincoln, Cotswold, Devon, and Romney Marsh; the fine, medium woolled South Devon, Shropshire, Dorset, and Hereford; and the small excellent mutton types of the more mountainous areas—the Welsh, Dartmoor, Exmoor, and Cheviot. Pigs (3,000,000), bred on most farms for pork and bacon, are fed on the offal of the corn farms, the waste products of the dairy, and foreign maize. Wiltshire, Cumberland, and Yorkshire are noted for their bacon and hams. The live stock fails to meet home demands, but its finest types are competed for by the dominions, colonies, and foreign countries.

Forestry. British forests are rare. Woods and plantations cover only 5.3 per cent of England, and 3.9 per cent of Wales. The existing scattered forests include the well-known New Forest (400 square miles) in Hampshire; Dean (150 square miles) in Gloucestershire; Arden in Warwickshire; Epping in Essex; Sherwood in Nottinghamshire; Charnwood in Leicestershire; Windsor in Berkshire; and the wooded portions of the Weald. Less well known are the woods of Whittlebury and Salcay in Northamptonshire; Needwood in Staffordshire; and Ashdown in Sussex. British forestry is now receiving national attention. Pine forests have been planted on the Pennines, the Welsh plateau, and Exmoor. There are 2,500,000 acres, unfitted for anything but afforestation. Wherever this land can be obtained cheaply (less than £5 per acre) forestry undertakings prove profitable if Douglas fir and Sitka spruce are substituted for Scots pine and common spruce, which are the principal trees grown at present on the hills.

Fishing. In range and importance the fisheries have steadily evolved to the position of the best manned and equipped of all fishing industries. Limited, at first, to fresh-water areas, they expanded to coastal, and, finally, to deep-sea fishing over a range of 3,500 miles from the White Sea and Iceland to the south of Morocco. The catch of 1931 was



London, Midland and Scottish Railway. (L.M.S.R.)
 London and North Eastern Railway. (L.N.E.R.)

Great Western Railway. (G.W.R.)
 Southern Railway. (S.R.)

Other Railways

valued at £12,300,000. From Hull, Whitby, Grimsby, Yarmouth, Harwich, Lowestoft, and Ramsgate steam and sailing trawlers seek the North Sea banks (Dogger, Silver Pits, Long Forties, and Well Bank), and "carriers" convey the hauls to the ports, whence fast trains carry them to the industrial centres. The trawl brings up flat fish (flounders, sole, plaice, halibut, and turbot) and cod, haddock, hake, and ling, which feed at the bottom of the sea in shallow waters. Brixham, Penzance, Plymouth, and St. Ives are trawling centres for the southern and south-western fisheries. The plankton feeders—herring, mackerel, and pilchard—are caught in drift nets. An important herring fishing ground is that off the coasts of the Isle of Man, and fishing fleets from Douglas, Peel, Liverpool, Southport, Blackpool, Fleetwood, and Whitehaven resort thereto. Herrings are caught also off the coasts of Norfolk, Devon, and Cornwall, and off Hastings; pilchards off the coasts of Devon and Cornwall; sprats at the mouth of the Thames and off the Goodwin Sands; lobsters on the reefs round Jersey, and off the coasts of Devon and Cornwall; prawns on the coasts of Kent and Sussex; mackerel in the English Channel; eels in the Bristol Channel; shrimps in the Wash; oysters from the artificial beds at Burnham-on-Crouch, Colchester, Faversham, Milton, and Whitstable; and whelks at King's Lynn and Grimsby. The salmon, eel, and trout fisheries of the rivers Eden, Severn, Dee, Tees, Taff, Towy, Usk, and Derwent are noted. Grimsby and Billingsgate (London) are the great fish markets.

Mining. To her great mineral wealth, especially in coal and iron, England must largely attribute her present world position of power. The early utilization of coal gave England a long lead over Continental nations, and led to the localization of industries, better communications, expanding markets, and the acquisition of colonies. The normal annual output is approximately 210,000,000 tons. Of the coal-fields those associated with the Pennines are the chief. They are the Northumberland and Durham; the Cumberland; the Lancashire (including North-east Cheshire); the York, Derby, and Nottingham; and the Midland, divided into the North and South Staffordshire, the Warwick, the Shrewsbury, the Worcester, the Coalbrookdale, and the Ashby-de-la-Zouch. The small coal-field of North Wales is probably a westward extension of the North Staffordshire. Around the Bristol Channel are the coal-fields of South Wales, the Forest of Dean, and the Bristol. Recently shafts have been sunk through the newer rocks to the concealed coal-fields in Kent and the north-eastern plain, with encouraging results. The most productive fields are the York, Derby, and Nottingham, with over a quarter of the output; the Northumberland and Durham with nearly a fifth; and the South Wales with over a sixth. Iron is the chief source of metallic wealth, but the home supply has to be supplemented by ore from Spain, Sweden, and Algeria. Over 80 per cent of the ores come from the ironstones in the oolitic limestone belt. The Cleveland Hills, Lincoln, Leicester, Rutland, Northampton, and Oxford are the chief centres. Haematite, or kidney ore, is found in the pockets and veins in the limestone rim which surrounds the older rocks of the Lake District, and in the limestones of North Wales and the Forest of Dean. The coal-measure ironstones

of South Yorkshire, Derbyshire, South Staffordshire, and South Wales now supply only a small percentage of the total output. Peat for fuel is obtained in Dartmoor, the Welsh plateau, south-west Lancashire and Cheshire, and the Pennine moors. For massive structures and for ornamental stones, the granites of Shap and Dartmoor are excellent; for roofing, the slates of Penrhyn, Llanberis, Festiniog, Corris, and Tilberthwaite are the best; and for paving and "road metal" the igneous rocks of North Wales, the Lake District, and Devon provide the most durable material. Bricks are made chiefly in the Thames Valley, Staffordshire, Hampshire, Kent, and Hertford. Firebricks are manufactured at Stourbridge and Tuddhoe. The coarse clay of the "Potteries" is used for the saggers in which the china is baked; but, for the fine porcelain, the kaolin or china clay of Cornwall is required. Salt occurs in the belt of red rocks, which runs in a great horseshoe round the Pennines, and is exploited in Cheshire (the Weaver Valley), North Lancashire, Stafford, Warwick, Worcester, North Yorkshire, and Durham. Gypsum is obtained mainly from the marls of the new red sandstone of Cumberland, Cheshire, Derby, Nottingham, and Durham. Flint is a product of the chalk escarpments of the south-east. Fuller's earth is obtained in Surrey, Bedford, and Bucks; gannister in many of the coal-fields; and limestone in most of the limestone and chalk regions. Tin is still mined in small quantities in Cornwall; and lead in Cumberland, Durham, Flintshire, and Derbyshire. Copper and zinc, in insignificant quantities, are mined, the former in North Wales, Cornwall, Devon, and Yorkshire, and the latter in Cumberland and North Wales.

Manufactures. Industrial England lies mainly westwards and northwards of a line drawn from the mouth of the Severn to the Wash. Specialization, especially in the textile and iron industries, and great market development are the distinguishing features of the manufactures. Of the textile industries, cotton is king. It is the greatest, most complex, most highly organized, and most specialized of all manufacturing industries, and is almost entirely located on the western slopes of the Pennines, mainly in Lancashire, south of the Ribble, and the adjoining parts of Yorkshire, Derbyshire, and Cheshire. Ninety per cent of the cotton operatives of Great Britain are found in an irregular quadrilateral area of roughly 30 miles by 25 miles, enclosed in the main by lines through Preston, Leigh, Stockport, and Colne. The southern exposed valley towns—Oldham, Bolton, Bury—where clay sub-soils keep water on the surface and thus aid evaporation, are the chief spinning centres; whilst the northern towns—Preston, Blackburn, Darwen—on drier plains or in sheltered valleys, are the weaving centres. A humid climate, a plentiful water-supply, water-power, coal, ease of communication, the favourable location for American trade, the once sufficient supply of iron for machinery, the hereditary skill in textile manufactures and genius for invention of textile machinery by Lancashire workers, the energy and organizing power of Lancashire employers, and the sea-gate of the Mersey and the modern construction of the Manchester Ship Canal, have all played their part in Lancashire's pre-eminence. Manchester, the natural route centre, is the great market and exchange. The British woollen industry is older

than the cotton, but is less important and less highly developed. The main output is from the eastern flank of the Pennines, where the dales run down to the West Riding coal-field. Local supplies of wool have largely to be supplemented by foreign supplies; but the excellent water supplies, the receptive Yorkshire minds, the coal at hand, and excellent transport facilities, are highly favourable factors. The towns tend to specialize. Bradford is noted for worsted goods, mohair braids, and velvet; Halifax for carpets, baize, and light worsteds; Huddersfield for broadcloth and dress materials; Dewsbury for shoddy; and Leeds for ready-made clothing. In the West of England, Stroud, Frome, Bradford-on-Avon, Devizes, Wilton (carpets), Witney (blankets), Trowbridge, and Westbury produce broadcloths and waterproofs, Bedford "cords" and putties. Flannels are made at several minor centres (Rochdale, Newtown, and Llanidloes), and Leicester has a large knit-goods industry. The iron industry is noted for the excellence of its products, and its premier position in shipbuilding. Iron-smelting is carried on in the Cleveland District (Middlesbrough), the Furness District (Barrow and Dalton), Yorkshire (Leeds, Rotherham, Low Moor, and Sheffield), South Wales, and the Black Country. Tin and zinc plate manufactures, and copper-smelting are characteristic of South Wales. Cardiff, Swansea, Llanelly, Newport, Neath, Merthyr Tydvil, and Aberdare are among the chief centres. The towns of the Black Country specialize in iron articles demanding a large amount of labour in proportion to the cost of the material. Wolverhampton (locks), Cradley Heath (nails and chains), Redditch (needles), Coventry (cycles), Walsall (saddlery), Bilston (enamelled ware), West Bromwich (gun-barrels, locks, and safes), Wednesbury (keys and edged tools), Bromsgrove (nails and buttons), Smethwick, and Dudley are noted centres. Birmingham, lying just outside the Black Country, is the great centre, manufacturing all kinds of iron goods from a needle to a steam-engine. Engines and railway carriages are manufactured at Darlington, Crewe, Eastleigh, Stratford, Doncaster, Derby, Horwich, Manchester, Swindon, Newcastle, Ashford, Oswestry, and Birmingham. Newcastle is noted for heavy ordnance; Woolwich for guns; Enfield for rifles; Birmingham for electro-plate; Sheffield for armour-plate, cutlery, machine tools, and ferro-alloys; Warrington for iron wire; Middlesbrough for steel rails; and Bristol for galvanized iron. Manchester, Salford, Oldham, Bolton, Accrington, Bury, and Rochdale make cotton machinery; Leeds and Keighley woollen machinery; and Leicester makes machinery for elastic webbing. Agricultural machinery and implements are manufactured at Ipswich, Peterborough, Huntingdon, Norwich, Newark, Gainsborough, Lincoln, and Grantham. Shipbuilding is carried on at ports with easy access to coal and iron. The Tyne ports (Newcastle, South Shields, North Shields, Gateshead, and Jarrow), Sunderland, West Hartlepool, Barrow, Birkenhead, Hull, and London are the chief centres. The Government dockyards are at Chatham, Portsmouth, Sheerness, Devonport, and Portland. Other iron centres are Workington, Wigan, Consett, and Frodingham. The automobile industry is centred at Coventry, Birmingham, and London. Macclesfield, Congleton, Leek, Bradford, Derby, Chesterfield, Ilkeston, Braintree, Halifax, and Manchester have

small silk industries; and artificial silk production is important in Lancashire, Yorkshire, the Midlands, and North Wales. Linen is made at Leeds, Barnsley, and Barnard Castle; and sailcloth at Sunderland, Hartlepool, and Stockton. The brewing industry is centred at Burton (ales and stout) and London (porter, stout, and gin). Minor industries are matches at London and Liverpool; paper in Kent, Derbyshire, Hertfordshire, and Lancashire; glass at Newcastle, Stourbridge, Bristol, St. Helens, Birmingham, Dudley, South Shields, Rotherham, Castleford, and Doncaster; furniture at Shoreditch and Hoxton (London), and High Wycombe (chairs); and straw-plait making-up at Luton, Dunstable, Hertford, and St. Albans. Boots and shoes are made at Northampton, Wellingborough, Stafford, Norwich, Leicester, Nottingham, and Higham Ferrers; and tanning is carried on in London and Bristol. Worcester, Woodstock, Yeovil, Hereford, Taunton, and Leominster are noted for gloves. The earthenware trade is mainly in Staffordshire. Stoke-on-Trent (Stoke, Burslem, Hanley, Longton, Tunstall, and Fenton) and Etruria are the chief centres. Derby and Worcester are noted for porcelain; Stourbridge for stoneware; and Lambeth for Doulton ware. Heavy chemicals are manufactured at Runcorn, Northwich, Widnes, Flint, Middlesbrough, Newcastle, and the Midlands; and dyestuffs and pharmaceutical products at Ellesmere Port, Manchester, and Middlesbrough. Of minor importance are the making of clocks and watches at London (Clerkenwell), Birmingham, Prescot, and Liverpool; soap and candle manufactures at London and Port Sunlight; sugar-refining and flour-milling at London and Liverpool; cocoa and chocolate manufactures at Bristol, Bournville, and York; and tobacco manufactures at Bristol and Liverpool.

Commerce. The United States and the United Kingdom are the leading commercial countries of the world, and judged by value per head of population, British commerce is easily first.

NATURE OF THE IMPORT AND EXPORT TRADE
OF THE UNITED KINGDOM

	1913		1931	
	£ MILLIONS		£ MILLIONS	
	Im-ports	Ex-ports	Im-ports	Ex-ports
1. Food, drink, and tobacco	290.2	32.6	417.0	35.5
2. Raw and mainly unmanufactured goods	281.8	70.0	173.4	47.1
3. Articles wholly or mainly manufactured	193.6	411.3	262.0	290.6
4. Animals not for food	—	—	3.3	1.1
5. Parcel post, non-dutiable articles	3.1	11.3	6.5	14.9
6. Exports of foreign and colonial produce (entrepôt trade)	—	109.6	—	64.0
Total Imports and Exports	768.7	634.8	862.2	453.2

From the table it is evident that merchandise imports predominate over exports, and, as exports must balance imports in the long run, this difference must be the excess of "invisible exports" over "invisible imports" of services, banking, insurance, shipping, and investments. Much of the excess of Britain's imports are food products and materials

(largely raw) for manufactures. The imports of manufactured goods (about 25 per cent by value) are due to Britain largely confining herself to the production of high quality goods and the importing of the cheaper grades. Manufactured goods form approximately 75 per cent of the total exports. Trade with the dominions and colonies amounts to about one-third of the external trade. The most important trade is carried on with the United States, India, Germany, France, Australia, Canada, South Africa, New Zealand, Holland, Belgium, Italy, Denmark, Spain, Sweden, Japan, China, Argentina, Brazil, and Egypt. The tendency of British trade is to concentrate more and more upon a few great ports of entry and departure: thus, the twelve leading ports—London, Liverpool, Hull, Manchester, Glasgow, Bristol, Cardiff, Southampton, Leith, Grimsby, and Dover—handle approximately 80 per cent of the total trade. London and Liverpool are predominantly the two chief ports, London leading in imports, Liverpool in exports. Together, they carry on 75 per cent of the entrepôt trade, and about 55 per cent of the foreign trade.

Trade Centres. More than 30,000,000 of the population are town-dwellers. England is largely a land of towns, while Wales (excepting the south and certain coastal districts) has few important trade centres. There are over forty towns with populations exceeding 100,000; and of these centres, eight have populations greater than 300,000, and ten others have more than 200,000. Industrial England claims by far the greater number of important trade centres (approximately two-thirds of the towns containing populations of over 50,000).

Ports. London (administrative county, 4,397,000; Greater London, 8,203,000), the capital of the United Kingdom and the largest city in the world, is the world's greatest seaport and financial centre. *Liverpool* (856,000), the second seaport, handles one-third of the total transit trade of the Empire. *Manchester* (766,000), the cotton metropolis, is second only to London as the headquarters of industrial, commercial, and financial interests. *Bristol* (397,000) trades largely with Ireland and the West Indies. *Hull* (313,000) is engaged in Baltic and North Sea trade, and imports large quantities of oil-seeds. *Newcastle* (283,000) is the chief port and centre of the Northumberland and Durham coal-field. *Portsmouth* (249,000) is the chief naval dockyard. *Cardiff* (224,000), the largest town in Wales, has an immense coal trade. *Southampton* (176,000) is a military and ferry port, and a terminus for American steamship lines. *Sunderland* (186,000) is a great shipbuilding centre. *Swansea* (165,000) is the second port of Wales. *Plymouth*, with *Devonport* (naval station) and *Stonehouse* (208,000) is a great mail and passenger port. *Birkenhead* (148,000) has shipbuilding and engineering works. Other ports are *Middlesbrough* (139,000), *Gateshead* (122,000), *South Shields* (114,000), *Newport* (89,000), *Grimsby* (93,000), and *Barrow* (66,000).

Industrial Centres. *Birmingham* (1,003,000) is the commercial, industrial, and intellectual capital of the Midlands. *Sheffield* (512,000) is the chief iron and steel manufacturing town of Yorkshire. *Leeds* (483,000) is the centre of the Yorkshire woollen industry. *West Ham* (294,000) is a town of recent, rapid growth. *Bradford* (298,000) is the chief seat

of the worsted manufacture. *Stoke-on-Trent* (277,000) is the centre of the pottery industry. *Nottingham* (269,000) is famed for its cotton hosiery. *Salford* (224,000) has similar industries to Manchester. *Leicester* (239,000) is famed for its woollen hosiery. *Croydon* (233,000) is the airport for London. *Bolton* (177,000) is a great cotton-spinning centre. *Rhondda* (141,000) is a coal-mining centre. *Coventry* (167,000) is a motor-manufacturing centre. *Oldham* (140,000) is a great cotton-spinning centre. *Tottenham* (158,000), *East Ham* (143,000), *Leyton* (128,000), and *Walthamstow* (133,000) are suburbs of London. *Derby* (143,000) is a great railway junction. *Blackburn* (123,000) is a cotton-weaving centre. *Stockport* (126,000) is a cotton centre. *Norwich* (126,000) manufactures agricultural machinery, mustard, and starch. *Preston* (119,000) is a cotton-weaving centre. *Huddersfield* (114,000) is noted for broadcloth. *Burnley* (98,000) is a cotton-weaving centre. *St. Helens* (107,000) has glass and chemical works. *Wolverhampton* (133,000) and *Walsall* (103,000) are engaged in the iron trade.

Residential Towns. *Brighton* (148,000) is a pleasure and health resort. *Southend-on-Sea* (120,000) is a favourite watering-place. *Wallasey* (103,000) is really a Cheshire suburb of Liverpool. *Bournemouth* (117,000) is a pleasure and health resort.

British Possessions. The British Empire comprises over one-fourth of the known surface of the globe (13,355,426 square miles) and over one-fourth of the total population of the globe (460,000,000). It possesses every type of civilization and climate, all the great commercial staples, almost every known metal, every stage of industrial development, every religion, and every human problem. It grew out of private enterprise and effort, and was the outcome mainly of the British love of liberty and zest for trade. Throughout history there has never been such a vast and complicated organization of peoples held together by their own assent and their own unfettered choice. The following is a summary—

Europe. The Irish Free State, Gibraltar, and the Maltese islands.

Asia. The Indian Empire, Ceylon, Cyprus, Aden, and Perim, the Straits Settlements, the Federated Malay Straits, other Malay States, Hong Kong, Kowloon, Lantao, British North Borneo, Brunei, Sarawak, Sokotra, Kuria Muria Islands, Bahrein Islands, Andaman and Nicobar Islands, Iraq (mandate), Palestine (mandate).

Africa. The Anglo-Egyptian Sudan, the Union of South Africa, Basutoland, Bechuanaland Protectorate, Southern Rhodesia, Northern Rhodesia, Uganda Protectorate, Zanzibar Protectorate, Kenya, Tanganyika, Togoland, South-West Africa Protectorate, Nigeria, Gold Coast Colony, Sierra Leone, Gambia, Somaliland Protectorate, Mauritius, St. Helena, Ascension Island, Nyasaland Protectorate, the Seychelles, Swaziland, Cameroon.

Australasia. The Commonwealth of Australia, New Zealand, Fiji Islands, Territory of Papua, Pacific Islands, Territory of New Guinea, Western Samoa, Nauru.

America. The Dominion of Canada, Newfoundland and Labrador, the Bahamas, Leeward Islands, Windward Islands, Barbados, Trinidad and Tobago, the Bermudas, British Honduras, British Guiana, the Falkland Islands, South Georgia.

Area and Population. Scotland, the northern portion of Great Britain, occupies an area of 30,405 square miles, and its population in 1931 was 4,842,584. As a race the Scots are thrifty, keen-witted, persevering, independent, indomitable, energetic, and practical. Of the various components of the race, the dark-haired western Highlanders are probably descended from a mixed Alpine and Iberian people, who came by way of Ireland; and the big-boned, red-haired Picts are probably descendants of Bronze Age migrants of mixed Alpine and Nordic stock, who made their way north along the English east coast. Fair-haired, blue-eyed Nordics overlie both, and in the Lothians are descendants of the Angles of the Elbe, and in Strathclyde the Brythonic element is strong. On all sides Scotland is surrounded by seas, except on the short southern boundary line, 70 miles across, from Solway Firth to the mouth of the Tweed.

Coast Line. The coasts of Scotland are deeply indented by arms of the sea, and no place is more than 40 miles from the coast. There is 1 mile of coast to every 11 square miles of area, a proportion greater than that shown by any other European country with the exception of Greece. Between Glasgow and Alloa, the east and west coasts approach within 24 miles of each other, and a ship canal, which could easily be constructed across this neck, joining the Forth and Clyde, would prove of great commercial and strategic importance. The generally rocky and mountainous western coast of Scotland has many drowned valleys, called lochs, which correspond to the fiords of Norway, and form excellent harbours; but the lack of productive hinterlands at present, and probably for all time, makes them of comparatively little importance. Only where the Clyde estuary stretches into the Lowlands is there a world seaport. The east coast is low; the only exceptions are where the Grampians and Lammermuirs stretch to the sea. Good harbours are found where the Tay and Forth reach into the heart of the Lowlands, and at the mouth of the Aberdeenshire Dee. The southern coast is mainly low and flat, and of small importance; while that of the north is high and rugged.

Relief. The mainland of Scotland divides into three regions: the Highlands, lying north of an almost straight line drawn from Stonehaven on the east coast to Helensburgh on the estuary of the Clyde on the west, are a dissected plateau, a relic of ancient Arctis, composed mainly of hard crystalline rock, and divided by the long, narrow, deep rift valley of Glenmore into the lower Northern Highlands and the higher Grampian Highlands (Ben Nevis, 4,406 ft.); the Midland or Rift Valley, lying between the Highland boundary fault and an almost straight line from Dunbar to Girvan, is the richest and most thickly populated area of Scotland, and the only part deserving the name of Lowlands; and the Southern Uplands, lying south of the Midland Valley and terminated by a line along the Solway Firth and the Cheviot Hills, is a dissected plateau of old, hard rock, gritty or slaty in type, younger, lower, tamer, less fractured, and folded than the Highlands.

Islands. *The Orkney Islands* (90 islands and islets, one-third inhabited; 375½ square miles; 26,000 population), separated from Caithness by the Pentland Firth, consist of Old Red Sandstone overlaid

in parts by glacial deposits. Sheep and cattle-rearing and fishing are the chief occupations. Kirkwall on Pomona is the chief centre. *The Shetland Islands* (about 100 islands and islets, 29 inhabited; 551 square miles; 28,000 population), lying 100 miles north of the Orkneys, are composed of hard, igneous rock. Only about one-thirtieth of the area is cultivated, chiefly with oats; but the rearing of sheep, cattle, and the tiny Shetland ponies is important. Fishing is a principal occupation. Lerwick, on mainland, is the chief centre. *The Western Islands* (over 500 islands, 102 inhabited; 2,811 square miles; 80,000 population) lie off the west coast, at varying distances, and extend from Sutherland to Argyre. They are divided into the Outer Hebrides (Lewis-with-Harris, North Uist, South Uist, Barra, and other islands), lying kite-like beyond the drowned rift valley of the Minch, and the Inner Hebrides (Skye, Mull, Jura, Islay, and other islands), which adjoin the coast. Fishing, the growing of a little oats, the rearing of sheep, and the making of the damp-resisting "Harris" tweed are the principal occupations. Stornoway in Lewis, and Portree in Skye are the chief centres. The islands of Bute and Arran, lying inside the Kintyre peninsula, are popular holiday resorts.

Climate and Vegetation. The climate of Scotland, as compared with that of England, is cold, cloudy, and damp, although the temperature is not, as a rule, so extreme as that of south-eastern England, seldom falling below 25° F., or rising above 65° F., the annual average being from 45° F. to 47° F. The summer is uncertain, and often includes several consecutive weeks of unsettled weather; but, on the other hand, the winters are rarely severe, except among the mountains. The mountainous parts of the west receive an annual rainfall of from 60 in. to 80 in. (maximum 160 in. on Ben Nevis), the western parts of the Southern Uplands and the Rift Valley 40 in. to 60 in., and the coastal plains and lowlands of the east 25 in. to 40 in.

Scotland is naturally a forest land, but most of the virgin forest has been cleared, and only 4.6 per cent of the surface is forest-covered. Moorlands (2,000,000 acres of deer forests) prevail in the north, grasslands in the south, while the central and marginal lowlands are tilled.

Land and Water Routes. The Clyde, Forth, and Tay are the chief navigable rivers, and provide convenient outlets for the products of the Central Valley; the Highland rivers are too fast flowing for traffic, and flow on the whole through thinly populated regions. Glasgow's trade and the traffic on the Clyde have been increased by the deepening of the Clyde from Dumbarton to Glasgow, which enables large vessels to reach the latter port. Of the canals, that of the Forth and Clyde, which connects these two rivers, enables only small vessels to proceed along it; and the Crinan Canal, cut through the Mull of Kintyre, shortening the voyage from the Clyde to the Hebrides and the north-west coast, as well as the Caledonian Canal, which utilizes Lochs Ness, Oich, and Lochy, giving a complete waterway of 60½ miles from the west to the east coast of Scotland, join no places of great trade, and are used mainly for the fishing industry and tourist traffic.

The railway routes of Scotland (railway mileage, 3,800) are interesting as showing the tendency of

railways to utilize, where possible, river valleys, coastal plains, and mountain and hill passes. The chief railways of the Southern Uplands are the Glasgow and South-Western (L.M. & S.R.), the Caledonian (L.M. & S.R.), and the North British (L.N.E.R.). Starting at Carlisle, the Glasgow and South-Western follows the northern coast of the Solway Firth as far as Dumfries, then ascends Nithsdale (to a pass at 700 ft.) and runs thence through Kilmarnock to Glasgow (St. Enoch). Branch lines run from Dumfries to Stranraer for the Irish traffic, and from Glasgow by Ayr to Stranraer. The Caledonian main line, starting also at Carlisle, follows the Annan Valley, climbs by an 8-mile long incline at 1 in 80 to the Beattock Pass (1,000 ft.), and then has an easy run down Clydesdale to Glasgow. At Carstairs the routes diverge (1) through Motherwell to Glasgow; (2) through Stirling, Dunblane (branch through Callander to Oban), Perth, and Forfar to Aberdeen; and (3) to Edinburgh. The western or Waverley route of the North British has the most difficult route of all, for it crosses two watersheds: (1) by the Riccarton Tunnel (nearly 1,000 ft.) and (2) by the Heriot Pass (900 ft.). Starting from Carlisle, it passes through Hawick and Galashiels, and descends the Esk Valley to Edinburgh. The East Coast route of the North British, starting at Berwick-on-Tweed, runs quite near to the coast till near St. Abb's Head, where it bends inland, and utilizes an easy pass to the Lothians; on its way to Edinburgh it passes through Dunbar and Prestonpans. Continuing from Edinburgh by the Forth and Tay bridges, it reaches Dundee, Arbroath, Montrose, and Aberdeen, and branches run through (1) Falkirk and (2) Bathgate and Airdrie to Glasgow. A branch also runs from Glasgow by Loch Lomond and the Moor of Rannoch to Fort William and Mallaig. The Highland railways are the Great North of Scotland Railway (L.N.E.R.), which runs from Aberdeen through Huntly, Cullen, and Buckie to Elgin, and has branches to Banff, Peterhead, and Fraserburgh; and the Highland Railway (L.M. & S.R.) from Perth, which utilizes glens and passes, and runs through Dunkeld, Blair Athol, Aviemore (branch to Elgin), Inverness, Dingwall (branch to Ströme Ferry), Tain and Helmsdale to Wick and Thurso.

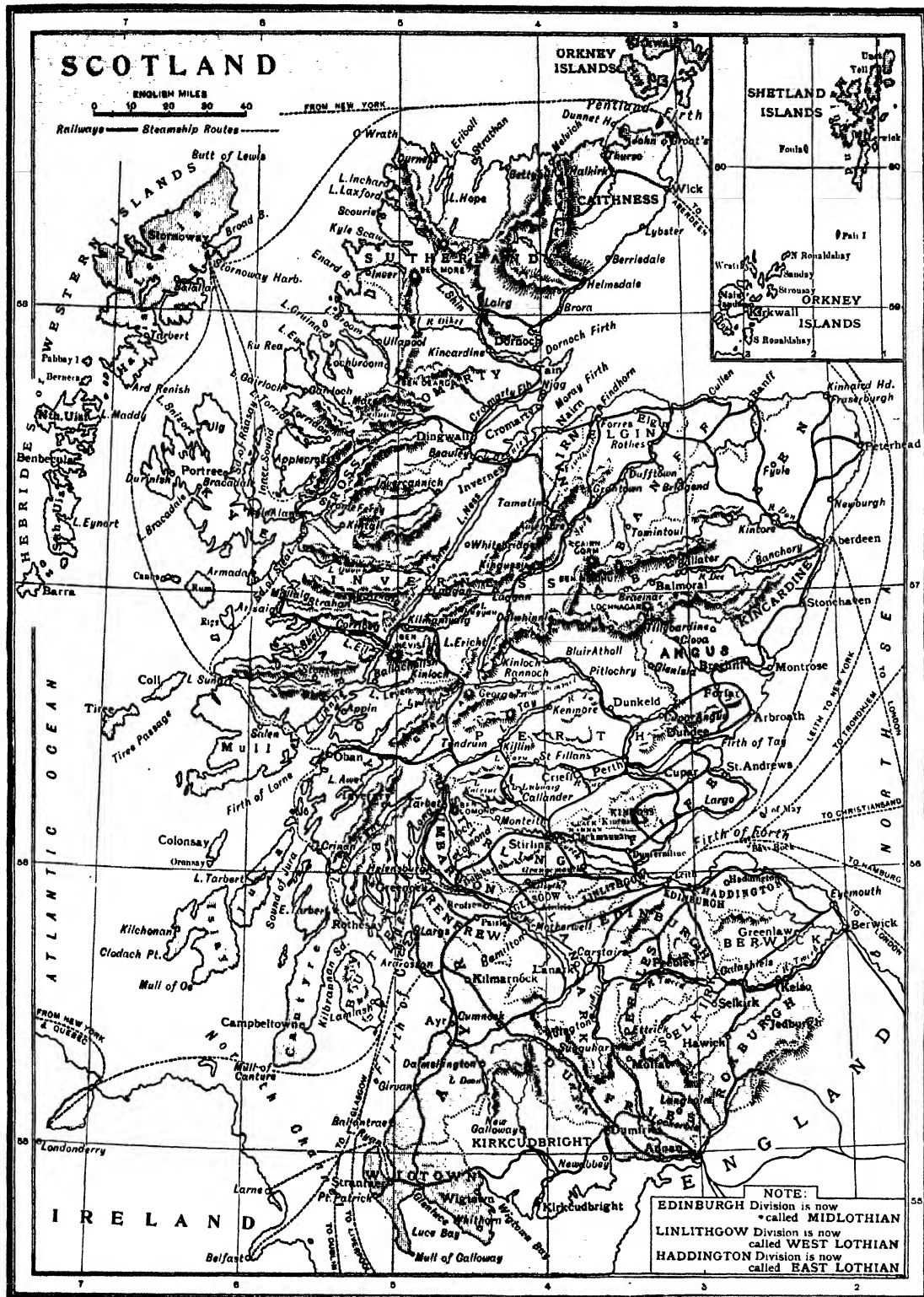
Productions and Industries. *Agriculture.* The mountainous nature of the greater part of the surface of Scotland, the thin soils of many regions, and the heavy rainfall of the west limit the growth of agricultural products to the coastal sills, the lowland districts, and some of the sheltered valleys in the Highlands. Out of a total surface of approximately 19,000,000 acres 14,250,000 acres are described as "rough mountain pastures, moor and waste." Of the remainder 3,250,000 acres are classed as arable, while 1,500,000 acres are in permanent pasture. The chief arable districts—Tweedside, Lothian, the East Neuk of Fife, the Vale of Strathmore, and the Howe of the Mearns—lie near the east coast. Oats (900,000 acres), the traditional food corn and chief grain of the country, are grown wherever the soil permits, and more especially in the counties of Aberdeen, Banff, Berwick, Haddington, Kincardine, Kinross, Linlithgow, and Wigtown. Barley (112,000 acres), used chiefly for the manufacture of whisky, is grown widely, but Fife and the Lothian counties are the most productive areas. Wheat (58,000 acres)

is to be seen as far north as Easter Ross, but only at low altitudes and on the better soils. The chief producing regions are Fife, Haddington, Linlithgow, Midlothian, Angus, and the Merse of Berwick. Much of the wheat is used for biscuit-making. Hay (567,000 acres) and root crops (379,000 acres) are important on all the arable farms for the winter fattening of cattle and sheep. In the Lothians, Fife, Perth, Angus, and Ayrshire, potatoes (144,000 acres) are largely grown for food purposes, and for seed for the growers of Lancashire and the Fen district. Raspberries, black and red currants, and strawberries flourish in the Carse of Gowrie, Strathmore, and Lanark. Scottish farmers are noted for their excellent intensive farming, by which they wring from comparatively poor soils crops equal and even superior in yield to those of other countries with better conditions of soil and climate.

About 75 per cent of Scotland is covered with grass of some kind, and all the hilly and mountainous districts are more or less pastoral regions. Sheep (7,600,000) are widely reared, but mostly in the Southern Uplands; the counties of Roxburgh, Selkirk, and Berwick have on the average one sheep to the acre. On heather land the sheep are usually hardy Blackfaces, yielding fine mutton and long, coarse wool used in the making of carpets and rugs. On the grassy hills of the Border district, and in Caithness and Sutherland, is the white-faced Cheviot, producing mutton of fine quality and wool for tweed suits. Cattle (1,250,000) are reared both in the Highlands and in Southern Scotland; in no county are they numerous. Most are found where the grass is rich and the winters fairly mild, conditions fulfilled in Renfrew, Wigtown, Stirling, Lanark, Kirkcudbright, Dumfries, the Lothians, Fife, and Aberdeen. Highland cattle, long-horned, and shaggy-coated, yield excellent beef; while the small brown-and-white Ayrshires are kept solely for the dairy. Horses (166,000) are reared in Fife and Linlithgow, and Clydesdale is noted for its heavy farm horses. Small ponies are bred in the Highlands and the Shetland Isles.

Fishing. The Scottish fisheries (value, 1931, £3,700,000) may be divided into the West Coast, the Orkneys and Shetlands, and the East Coast. The fish caught include cod, herring, halibut, haddock, skate, mackerel, lobster, and turbot. Stornoway, Portree, Mallaig, and Ströme Ferry are the centres of the Hebrides fisheries; being remote from the populous Midland Valley, the Hebrides have laboured under a disadvantage as regards transport, but railways, aided by Government subsidies, have been constructed through the Scottish Highlands, and thus provide quick transit. The Clyde ports are also engaged in the Western fisheries. Lerwick is the chief centre of the Northern fisheries, and, as the fish are largely salted for the markets of the Latin countries, quick transit is not here so necessary. The chief centres of the Eastern fisheries are Wick, Aberdeen, Lossiemouth, Peterhead, Stonehaven, Fraserburgh, and the Forth ports. From Aberdeen and Leith trawlers go eastwards to the North Sea banks. The whale fishing in the Arctic seas, from the eastern ports, formerly important, has now greatly declined. Salmon and trout are caught in the Tweed, Tay, Spey, Don, and other rivers. About 30,000 men are engaged in the fishing industry.

ENGLISH MILES
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Railways ——— Steamship Routes - - - - -



Mining. The Midland Valley is rich in minerals, and contains practically all the coal of Scotland. Coal is found in the Lower Carboniferous instead of in the Coal Measures as in England. The chief coal-fields are: the Ayrshire, from Cumnock to Dalry; the Central in Lanark, Linlithgow, and Stirling (mines half the Scottish output; 34,000,000 tons annually); the Edinburgh or Midlothian; and the Clackmannan and Fife. Oil shale is worked in Midlothian, West Lothian, Ayrshire, and Fife; from it are obtained, by distillation, oil, wax, and ammonium sulphate. Iron, now inadequate for local demand, occurs chiefly on the Lanark and Ayr coal-fields. Glasgow, Airdrie, Coatbridge, Motherwell, and Kilmarnock are the chief centres. Blackband and clayband iron ores are found, but they have now to be supplemented by the red haematite of Spain. Excellent material, suitable for the construction of bridges, reservoirs, and large buildings, is provided by the granites of Aberdeenshire and Galloway, the Craigleith sandstone, the red sandstone of Dumfries, and the massive building stone of Cromarty; and the flagstones of Caithness are excellent for pavements. Blue, green, and grey slates are found in Perthshire and Argyllshire, at Easdale and Ballachulish. Peat is found in many parts of the Highlands, where it is cut and dried for fuel. In the Lowther Hills, lead, associated with a small percentage of silver, is found, and both metals are extracted at Leadhills and Wanlockhead.

The Manufacturing Industries. Of the manufacturing industries that of iron is of high importance, and in it there is much specialization. Local clayband iron ore is smelted at Ayr, Dalmellington, Kilwinning, Glengarnock, and Muirkirk, and is supplemented by foreign ore. The Lanark coal-field, with important supplies of blackband iron ore and calciferous sandstone, is pre-eminent in the iron and steel trades. On both sides of the Clyde estuary from Glasgow to the sea are the greatest shipbuilding and marine engineering works in the world. On the north side are Dumbarton, Bowling, Kilpatrick, Dalmuir, Clydebank, Partick, and Glasgow; on the south, Greenock, Port Glasgow, Renfrew, and Govan. The great smelting and engineering centres are Coatbridge, Airdrie, Motherwell, Wishaw, Kirkintulloch, Newmains, Shotts, and Falkirk (Carron works founded 1759). Clydebank makes the Singer sewing machines; and machinery for mining, quarrying, and the textile industries is manufactured at Glasgow, Paisley, and Motherwell. Excellent communications, the coal in the neighbourhood, and the easily obtainable iron ore give these centres great advantages. The cotton manufacture, centred at Glasgow, Paisley (thread), Lanark, Hamilton, and Renfrew has almost all the advantages of the Lancashire region. In the Tweed Valley, on the north bank of the Forth, at the foot of the Ochils, and round Aberdeen, the woollen industries are concentrated. Galashiels, Peebles, Hawick, and Selkirk notably, and Jedburgh, Kelso, Coldstream, Greenlaw, Melrose, Langholm, and Dumfries in minor degree, have tweed and hosiery industries, formerly dependent on local wool, pure water, and water-power, and now surviving by industrial inertia, the necessary coal, iron, and machinery being obtained from the Midland Valley, and much

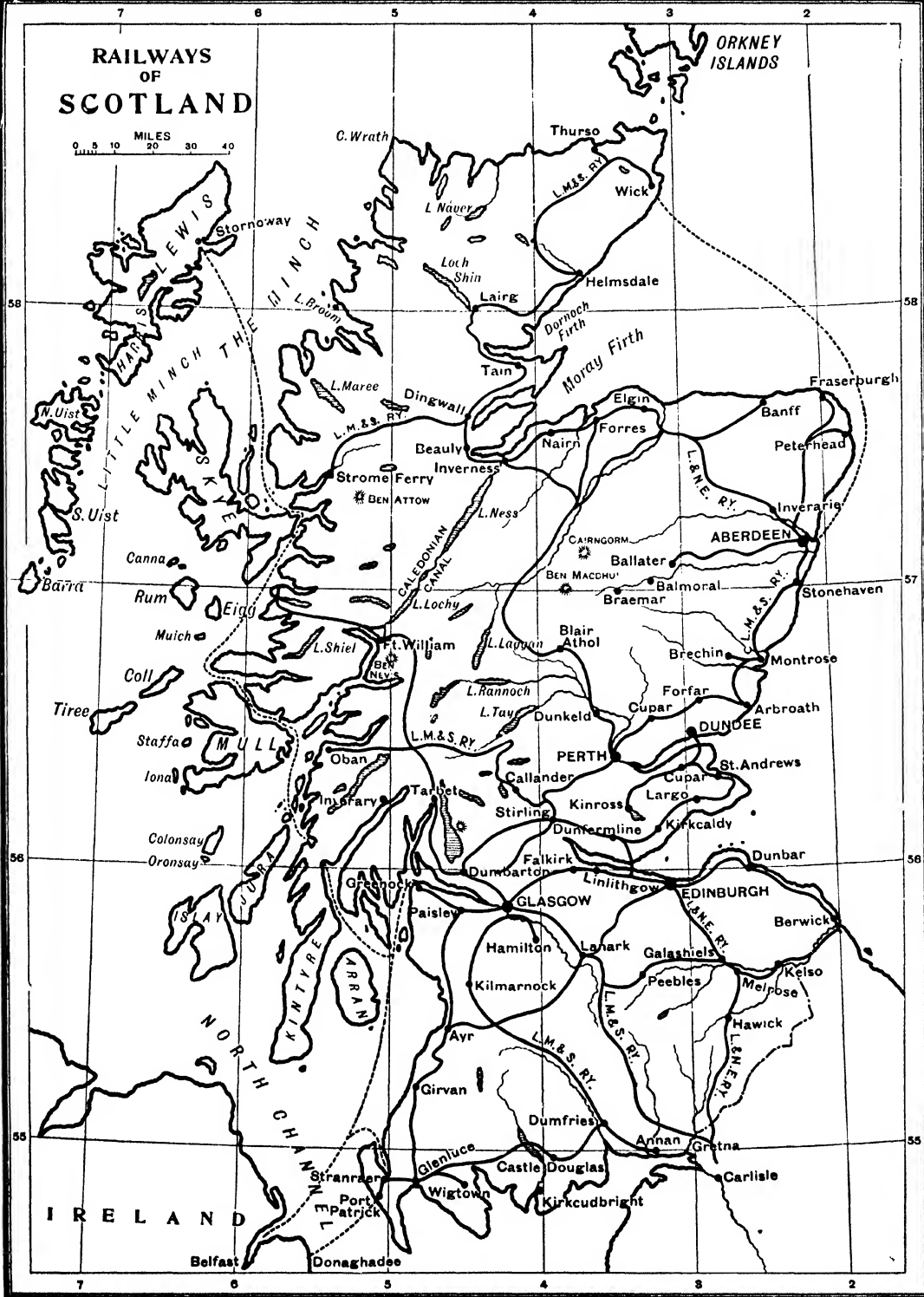
of the wool from Australia. Tartans and plaids are manufactured at Stirling and Bannockburn, and Kidderminster carpets at Ayr and Kilmarnock. Alloa, Alva, and Tillicoultry specialize in woollen yarn. Darval, in Ayrshire, is world-famous for its lace. Fife possesses advantages for the linen industry in the coal of the Fife and Clackmannan coal-field, the humid atmosphere, and the ease of obtaining flax from the Baltic countries. Dunfermline, the chief centre, is noted for its table linen; Kirkcaldy (also noted for its linoleum and oil-cloth), Forfar, Arbroath, Montrose, Brechin, and Dundee make coarser linens. Jute and hemp manufactures are confined to Dundee, Arbroath, and Montrose, jute being obtained from India and hemp from Russia. Chemicals are manufactured at Glasgow, Dumbarton, Larkhall, and Falkirk; and sugar is refined at Greenock. In the oil-shale districts candles are manufactured, and at Roslin explosives are made. Paper-making is carried on in Penicuik and other neighbouring villages, the pure water and wood pulp (the latter from Norway and Sweden) lending aid. Dundee is noted for its jam and orange marmalade. Beer is chiefly brewed at Edinburgh, and whisky is distilled in the Highlands and all the large cities. The famous Harris tweed cloth is made by the crofters of the Highlands and the Hebrides. An interesting feature of Scottish industries is the utilization of the water-power of the Highland rivers and waterfalls in recent years for the electrical extraction of aluminium from its ores by the British Aluminium Company at the Falls of Foyers on Loch Ness, and at Kinlochleven, near Ballachulish.

Commerce. The foreign trade of Scotland is largely conducted by Glasgow, whose greatest trade is with America. The east coast ports trade with the Baltic and North Sea countries of Europe, and also do an exclusive coasting trade. On the west the chief ports are Glasgow, Greenock, and Ardrossan; while those of the east coast are Leith, Grangemouth, Dundee, and Aberdeen. The sea routes between Scotland and Ireland are Glasgow and Greenock to Londonderry, Belfast, and Dublin; Ardrossan and Troon to Belfast; and Stranraer to Larne (the shortest sea passage between Great Britain and Ireland). The principal exports are manufactured goods (including iron, linen, cotton and woollen goods, whisky), coal, cattle, and fish; and the imports, as might be expected, are chiefly raw materials for manufactures and foodstuffs of all kinds.

Trade Centres. The population of Scotland is chiefly centred in the Midland Valley, especially in the Forth and Clyde basins, and in the coastal towns. Over one-third of the total population is contained in the four towns: Glasgow, Edinburgh, Aberdeen, and Dundee. *Glasgow* (1,088,000) is the second city of the British Isles and the premier port of Scotland; *Edinburgh* (439,000) is the banking, insurance, legal, literary, educational, ecclesiastical, and political capital of Scotland; *Dundee* (176,000) is the largest manufacturing town of Eastern Scotland; *Aberdeen* (167,000) is a port, and a fishing and manufacturing centre; *Paisley* (86,000) is a cotton centre; *Greenock* (79,000) refines sugar; *Leith* (81,000) is the seaport of Edinburgh.

MILES

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Position, Area, and Population. Ireland, the Emerald Isle, the land of crag and glen, of lake and plain, is an outlier of Great Britain, an island standing near the edge of the continental shelf, inviting attack. From Scotland it is separated by the North Channel, from England by the Irish Sea, and from Wales by the St. George's Channel. Westwards stretches the Atlantic, the narrowest part of which, between St. John's, Newfoundland, and Valentia Island, is little more than 1,600 miles. Politically, Ireland is divided into the Dominion of the Irish Free State (the Provinces of Leinster, Munster, and Connaught, with the Ulster counties of Cavan, Donegal, and Monaghan; (26,592 square miles; 3,000,000 population); and Northern Ireland (5,263 square miles; 1,260,000 population), a part of the United Kingdom, embracing the six Ulster counties of Antrim, Armagh, Down, Fermanagh, Londonderry, and Tyrone, with the Parliamentary boroughs of Belfast and Londonderry. The true Irish people of the south, south-west, and west feel themselves to be a distinct nation. They have kept their own language; feel the fascination of the land; and, though emigration has been great, many have remained rooted to the land. In character they are courteous, quick in perception, humorous, and apt of expression, conservative in method, with a deep sense of the supernatural in ordinary life. Part of the east and most of the north are more akin in race, work, and outlook to the larger sister island.

Relief. The general form of the surface of Ireland resembles a shallow basin, the highlands being grouped along the coast. About one-third of the total surface is occupied by the Central Plain, which stretches roughly between Drogheda and Dublin on the east, and between Donegal Bay and Galway Bay on the west. It is composed of carboniferous limestone, floored in many parts with boulder clay. Its surface is gently undulating, and here and there it is dotted by small, moraine-dammed lakes, but most of the lakes are in hollows, produced by the solvent power of acid waters on the underlying limestone. The Western Highlands, a continuation of the Scottish Highlands, comprise the poorest region of Ireland, but their purple hills have an enduring fascination to the peasant. There are three distinct upland masses: the Ox Mountains, between Sligo Bay and Killala Bay; the district of north-west Mayo, between Killala Bay and Clew Bay; and the awe-inspiring Connemara district, between Clew Bay and Galway Bay. The mountains of Cork and Kerry, the most continuous in Ireland, consist mainly of parallel ridges of Old Red Sandstone, with intervening valleys of shale and limestone, running generally in an east-and-west direction. At the northern base of the highest ridge, the Macgillivuddy's Reeks, are the lovely Lakes of Killarney, "the Eden of the West," above which rises Carran Tual (3,414 ft.), the highest peak in Ireland. In the south-west, the Wicklow Hills, running in a north-east-south-west direction, rise in Lugnaquilla to over 3,000 ft. Their valley forests please the eye of poet and artist, especially in the Vale of Avoca. The north of Ireland is a region of highland masses, separated by belts of lowland and drained by rivers. West of the broad lowlands of the Bann, the north-east-south-west direction of the granitic and crystalline mountains, and the fiord type of coast, show them to be outliers of the Scottish Highlands;

eastwards, the lava-capped basalt plateau of Antrim is a continuation of the lava flows of the Inner Hebrides, and the much dissected granitic and volcanic Mourne Mountains, rolling down to the sea, repeat the Southern Uplands.

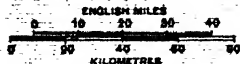
One-eighth of Ireland is covered with bogs, few of which have been reclaimed. The Bog of Allen (nearly 400 square miles), the largest, extends from about 20 miles west of Dublin across the lowlands almost as far as the Shannon. Peat, dug from the bogs, is used as the chief fuel, as litter in the cattle sheds, and for various industrial purposes. Ireland has many fine rivers, several of which expand to form lakes at various points in their course, and fall into the sea at the heads of spacious estuaries. The Foyle, Bann, Boyne, Liffey, Slaney, Suir, Blackwater, Lee, Moy, Erne, and Shannon are the chief. Where the Shannon cuts its way through the Slieve Bernagh and Silvermine Mountains is the Killaloe gorge. Here a great hydro-electric scheme supplies Ireland with cheap electric power.

Climate and Vegetation. As scarcely any part of Ireland is more than 50 miles from the sea, the climate is mild, equable, and moist. The range of temperature is less than in Britain, the least (16° F.) being in the south-west, the greatest (20° F.) in the north-east. The mean summer temperature is about 2° F. lower than in England generally, and grain and fruit ripen later, and with less certainty than in England; but the winter average is about 2° F. higher in Ireland, and grass grows for a longer period, thus aiding the pastoral industry. In the west and south-west coastal mountain lands the rainfall is heavy (40 in. to 60 in.); eastwards, in the lee of the mountains, the fall diminishes, and Dublin and Dundalk have less than 30 in. Soft, persistent, and well-distributed rain produces a freshness of greenery of grass and leaf that has earned for Ireland the name of "The Emerald Isle"; and the exquisite light of the late afternoons, when the rain is over, makes fields and streams enchanting.

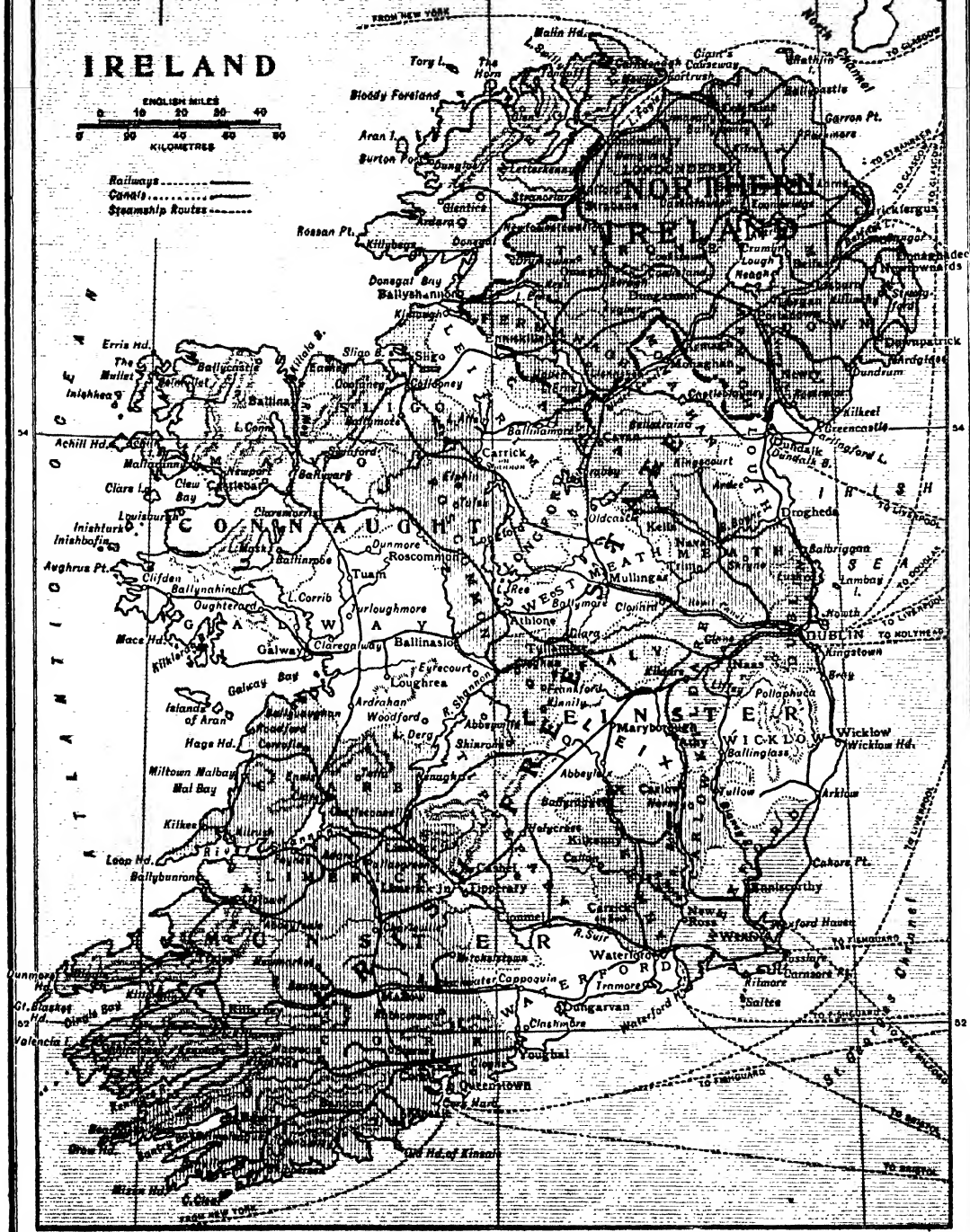
Climatically, Ireland is a region favourable to temperate forest, but the wooded area embraces only 1.5 per cent of the country. Grass is the chief vegetation, nearly half of the land being under permanent pasture.

Land and Water Routes. Communication between different parts of Ireland is good, and easier than is generally supposed. Roads have easy gradients, and motor-cars and the Irish long cars act as "feeders" of the railways. Northern Ireland possesses 765 miles of railway, and the Irish Free State 3,023. Over 2,500 miles are single track, and the chief gauge is 5 ft. 3 in. None of the railways, except a few lines in the immediate neighbourhood of the largest towns, has to carry a large traffic, either in passengers or merchandise, and they have been easy to construct. Under the provisions of the Railway Acts, 1924, three of the principal railway companies—the Great Southern and Western, the Midland Great Western, and the Cork, Bandon, and South Coast—amalgamated. The Dublin and South-Eastern Railway, together with twenty-two minor companies, was merged with the new undertaking as from 1st January, 1925, under the title of the Great Southern Railways Company. The Great Northern System (G.N.I.R., 560 miles) includes the important main line between Dublin and Belfast, which runs close to the east coast by Drogheda and

IRELAND



Railways
Canals
Steamship Routes



Dundalk, follows the important pass between Slieve Gullion and the Mourne Mountains, by Bessbrook, and enters the Lough Neagh Plain, serving Portadown (branches to Armagh, Monaghan, and Clones; to Dungannon and Omagh; and from Dungannon to the Tyrone coal-field), Lurgan, and Lisburn. From Dundalk a north-western branch runs to Clones, Enniskillen, Omagh, Strabane, and Londonderry. The Northern Counties System (owned by the L.M. & S.R.) runs from Belfast along the shore of the Lough, thence to Antrim, Ballymoney, and Coleraine, and westward to Londonderry. Another line serves Carrickfergus and Larne. The former Great Southern and Western System (1,130 miles) links Dublin by Kildare and Portarlinton with Waterford, whence lines reach Wexford, Rosslare, Mallow, Cork, Youghal, Killarney, and Dingle; with Limerick and Tralee; and with Mallow *via* Thurles. From Limerick the line is carried northward through Athenry, Tuam, and Claremorris to Sligo. The former Midland Great Western System (516 miles) runs through the midst of the Central Lowland from east to west. From Dublin it serves Maynooth, Mullingar, Athlone, Athenry, and Galway, whence it continues into Connemara and terminates at Clifden, the great wireless station on the Atlantic. An important branch line runs from Mullingar to Longford, Carrick, and Sligo; and from Athlone another runs to Roscommon, Claremorris, Killala, Westport, and Achill Sound. The former Dublin and South-Eastern System runs south from Dublin by Kingstown and Bray, and close along the coast to Wicklow; thence, after passing through hilly country, it traverses the Vale of Avoca, touches the coast at Arklow, runs inland to Enniscorthy, after which branches run south-westward to New Ross and Waterford, and south-eastward to Wexford and Rosslare.

The rivers are more or less navigable, and have ports at their mouths; but the Shannon, the longest, is impeded by rapids. Ireland is admirably suited to the construction of canals; but, though there are several (Northern Ireland, 180 miles; Irish Free State, 680 miles), they have partly decayed, and are not as important as they should be in the scheme of inland transport. The Shannon Canal System is the most important. It consists of the Royal Canal (96 miles) from Dublin to Richmond Harbour on the Shannon; the Grand Canal (208 miles) from Dublin by Naas and Tullamore, across the Shannon to Ballinasloe-on-the-Suck, with a southern branch to Athy-on-the-Barrow; and the Shannon Navigation (157 miles) from Shannon Harbour to Limerick, which avoids the rapids in the river. The Northern Canal System includes the Ulster Canal, linking the Lough Erne System with the Blackwater and Lough Neagh, *via* Clones and Monaghan; the Lagan Canal from Lough Neagh to Lisburn and Belfast; and the Newry Navigation and Ship Canal linking the Bann with Carlingford Lough, *via* Newry.

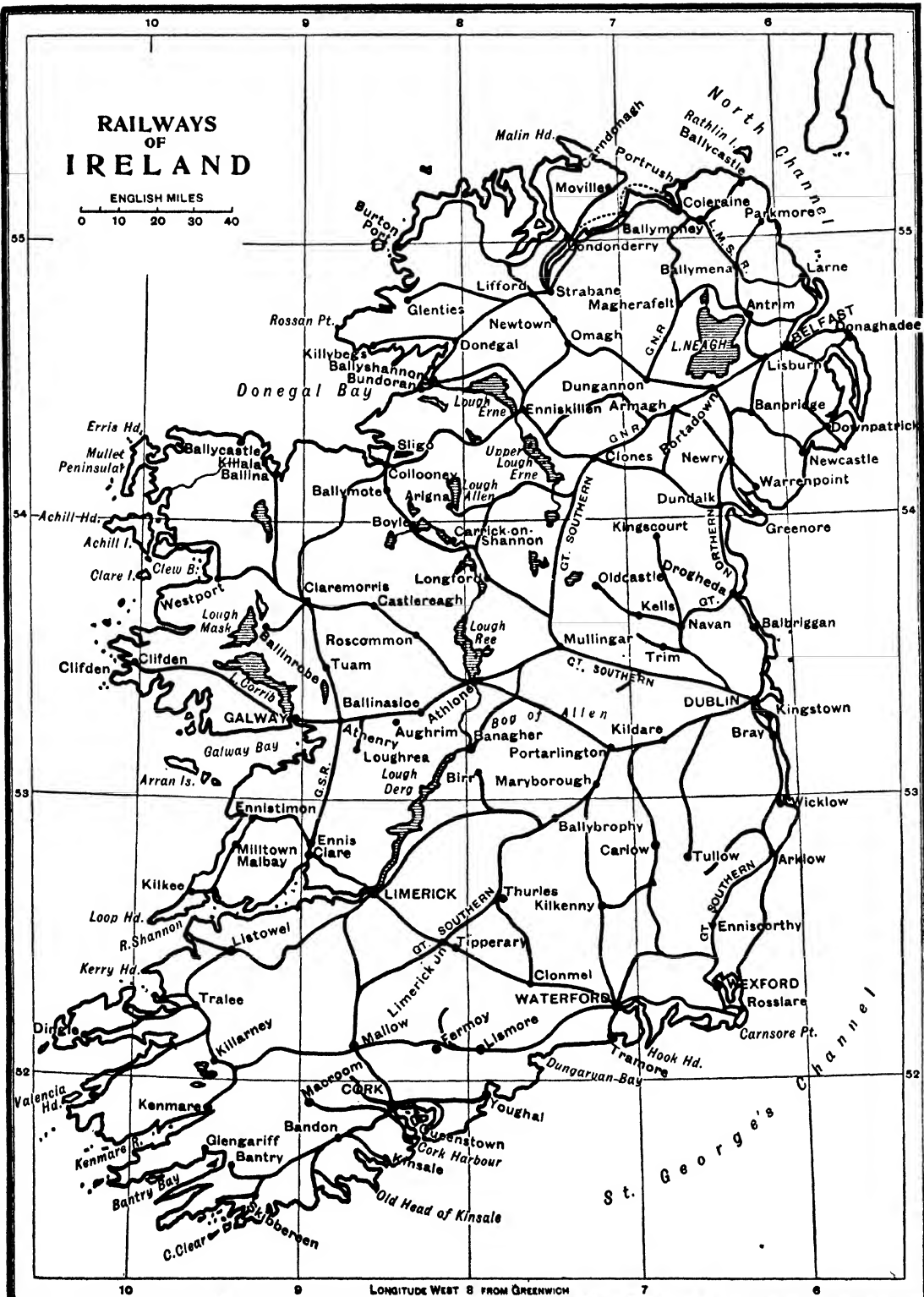
The most important passenger services between Ireland and Great Britain are: Larne to Stranraer (31 miles); Belfast to Fleetwood, Heysham, and Liverpool; Dublin and Kingstown to Holyhead (60 miles); and Rosslare (a new port opened in 1906) to Fishguard. Belfast has steamship services with Glasgow, Ardrossan, Ayr, Barrow, Douglas, Cardiff, Swansea, Southampton, and London; Greenore with Holyhead; Dublin with Glasgow, Silloth, Douglas,

Heysham, Liverpool, Cardiff, Swansea, the southern English ports and London; Londonderry with Glasgow, Heysham, Fleetwood, and Liverpool; Sligo with Glasgow and Liverpool; Cork with Glasgow, Liverpool, Fishguard, Bristol, and the southern English ports; and Waterford with Fishguard. From London and the south the most direct route to Ireland is *via* Fishguard and Rosslare, but much traffic goes *via* Holyhead and Dublin, which is the most direct for the Midlands. Some steamers for Canada from the Mersey and the Clyde pass round the north of Ireland, and for these the mail port is Moville, on Lough Foyle; the main route, however, proceeds along the southern Irish coast, and Queenstown (Cobh) on Cork Harbour is the mail port. For the Canadian ports, especially those on the St. Lawrence, Galway on the west coast offers considerable advantages, and proposals have been made for converting it into a port for American traffic. This would shorten not only the sea voyage, but also the railway journey, the present mail route between Dublin and Cork being very circuitous.

Production and Industries. *Agriculture and the Dairy Industry.* The chief grain crops are oats (the most widely distributed), barley (principally in the south-eastern counties), and wheat (Down, Dublin, Wexford, Cork, Limerick, Tipperary, Kilkenny, and Galway). Potatoes, the characteristic Irish root crop and staple food, are grown throughout Ireland, but chiefly in Ulster and Wexford. Cheap labour allows of the cultivation and preparation of flax in Ulster. The areas under the different crops in Northern Ireland are: hay, 448,000 acres; oats, 307,000; potatoes, 156,000; turnips, 43,000; flax, 37,000; and fruit, 9,000. In the Free State the acreages are: hay, 2,155,000; oats, 649,000; potatoes, 364,000; turnips and mangolds, 274,000; barley, 129,000; and wheat, 31,000. Over 60 per cent of the farms are less than 30 acres. Agriculture still suffers from the effects of past emigration, low wages, and inferior farming methods. More people, however, own the lands they farm; others hold their farms on better terms than formerly; and the two Governments are gradually establishing scientific methods. The rearing of cattle, horses, and pigs is of far greater importance than agriculture on account of the unsuitability of much of the land for the plough, and the heavy rainfall. Animals can live outdoors all the year round owing to the mildness of the climate, and there is always an abundance of natural food for them. Given more capital and time Ireland should rival Denmark. The most important cattle-rearing regions are in Kildare, Armagh, Dublin, Londonderry, Limerick, Kilkenny, and Meath. Two famous cattle breeds are the small, hardy Kerry and the Dexter. Irish horses are famous, and the annual horse-show in Dublin is a most important function. The counties of the eastern and northern coasts, from Dublin to Londonderry, are noted for heavy cart-horses; the midland and southern counties, especially Cork, Limerick, Tipperary, Carlow, Kildare, Waterford, Meath, and Westmeath for hunters; Galway, Mayo, and northern Antrim for ponies, and horses for general purposes are bred all over the country, but especially in Ulster. Pig-breeding is important, and Irish bacon and ham command good prices. Wexford, Carlow, Longford, Cavan, Monaghan, Louth, Armagh, Antrim, Cork, and Waterford have the

RAILWAYS OF IRELAND

ENGLISH MILES
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greatest number of pigs. Bacon and ham curing are most important at Limerick, Cork, Waterford, Tralee, Londonderry, Belfast, Ballymena, Dublin, Enniscorthy, Dundalk, and New Ross. Sheep are kept chiefly in Mayo, Cork, Tipperary, Meath, Wicklow, and Wexford. Dairy farming is of prime importance. During recent years co-operative dairy societies and co-operative poultry societies have been established, owning creameries for the scientific production of cheese and butter on a large scale, and centres for the collection and grading of eggs. Much of Ireland's total export trade is in cattle and dairy produce; and the bulk of it is carried on with Britain. The distribution of domestic animals is: Northern Ireland, 738,000 cattle (24,000 sheep; 229,000 pigs; and 93,000 horses); Irish Free State, 4,200,000 cattle (3,263,000 sheep; 938,000 pigs; and 433,000 horses).

Fishing. The Irish sea-fisheries, though rich, are little developed, owing to distance from large markets, the poverty of the people, the narrowness of the Continental Shelf on the west, the storms of the Atlantic, and the absence of curing stations. Of great value are the mackerel fisheries, which extend from Broad Haven to the Old Head of Kinsale. Cod and ling are found off the south coast and in the Irish Sea in winter and spring; and the herring grounds of the bays and harbours of the west, south, and east sometimes furnish valuable supplies. Salmon are caught on all parts of the coast at the mouths of the rivers, and notably in the Shannon, Erne, Corrib, Foyle, Bann, Boyne, Suir, Barrow, and Blackwater. For trout the lakes of Westmeath and Ballynahinch in Connemara are famous. Oysters and lobsters are found locally, and there is a considerable trade in periwinkles. Naturally, the chief fisheries are off the south coast, and in the Irish Sea, near the centres of population. The annual value of the fish landed is about £450,000.

Mining. The mineral resources are not large. Ireland consumes annually 4,500,000 tons of coal (home production only 92,000 tons), and from 5,000,000 to 6,000,000 tons of peat. Recent investigations prove that there is a probable total coal reserve of about 225,000,000 tons, and that under proper direction the annual output should reach 500,000 tons. The chief coal-fields are the Leinster or Kilkenny (Castlecomer, 110 square miles) producing excellent anthracite; and the Ballycastle in North Antrim, the County Tyrone about Coalisland and Dungannon, the Arigna on both sides of Lough Allen, and the Slieverdach or Tipperary, producing bituminous coal. Peat compensates for lack of coal (over 3,000,000 acres), and has become an important article of commerce. Copper is mined in the Wicklow Hills and in County Cork; lead at Glendalough, in Wicklow, and at Ballysadare, in Sligo; and zinc in Tipperary. Granite is quarried in Wicklow, Galway, Donegal, and the Mourne Mountains; black marble in Galway and Kilkenny; red marble at Little Island and Fermoy; grey marble in Donegal and Roscommon; and green marble in Connemara and Galway. The quarries of Killaloe, Carrick, and Valentia Island afford large-sized excellent slates. Iron ores are mined in Kilkenny, Tyrone, Leitrim, at Arigna, and in Antrim near Glenarm, Ballymena, and Cushendale. Bauxite is obtained in Antrim, and sent to Kinlochleven. Rock-salt is important in the Carrickfergus district of Antrim. Gold and

silver, in small quantities, are found in the Croghan Kinshela and Avoca districts of Wicklow.

Manufactures. Lacking coal, limited in its supply of enterprising men and women, and largely lacking the educational facilities prevalent in Britain, Ireland possesses large-scale industry only in Ulster. The chief industrial region lies east of a line joining Londonderry with Newry, and has linen-making as its main industry. The home-grown flax, supplemented by supplies from Belgium and the Baltic countries, Scottish coal and machinery, Scottish skill and organizing ability, the pure water for washing and bleaching, the moist climate, and the cheap labour, are the factors which make it prosperous. Belfast is the chief centre, but many other towns are engaged. Such are Londonderry (shirts), Lisburn (damasks), Portadown and Lurgan (cambrics and lawns), Monaghan and Armagh (brown holland), Lurgan and Enniskillen (bleaching), Larne (handkerchiefs), Newry (flax-spinning), Coleraine (shirts), Ballymena, Ballymoney, Coleraine, Limavady, Dundalk, Donaghadee, Drogheda, and Newtownards. Another important industry is ship-building carried on at Belfast, and, to a lesser extent (smaller vessels), at Londonderry, Cork (Haulbowline), and Dublin. Natural advantages are few; but the efficiency of the workmen, the exceptional ability of the founders of the industry, the ease of obtaining coal and steel from south-western Scotland and north-western England, and the good accommodation for the building and launching of ships, especially at Belfast, are the main factors in the great success of the Ulster shipyards (notably Harland and Wolff). Hand-made lace of various kinds and beautiful patterns is produced in the convents at Limerick, Carrickmacross, Kenmare, Youghal, and New Ross; poplin, a rich material made of wool and silk in combination, is manufactured in Dublin; hand-woven Irish tweeds (dyed by means of local plant products) are produced in Donegal, Mayo, Kerry, and the Connemara district of Galway; and other thriving local industries are carpet-weaving (using the old Celtic designs), rope-making (Belfast, Londonderry), glass (Waterford), and pottery (Wexford, Dublin, Belfast). The brewing and distilling industries have attained large dimensions. Normally one-half of the barley crop goes to the breweries of Dublin (porter), Cork, Drogheda, Dundalk, Kilkenny, Waterford, Dungannon, Clonmel, Clonakilty, Bandon, and Castleballingham. The brewing trade is dominated by Messrs. Guinness & Co., whose output is more than double that of all the other Irish firms together. Most of the rest of the barley and much of the oats go to the whisky distilleries of Dublin, Belfast, Cork, Bushmills, Comber, Londonderry, Coleraine, Dundalk, Wexford, Birr, Galway, Kilbeggan, Monasterevan, and Tullamore. Harness leather and boot leather for soles are produced in many parts; but the chief tanneries are at Limerick, Cork, New Ross, Dunmanway, Bantry, Ballytore, Clonmel, Dublin, Drogheda, Newry, Belfast, Coleraine, and Londonderry. Belfast has tobacco manufactures, and Dublin biscuit manufactures.

Commerce. The commerce of Ireland is chiefly with Great Britain (about 85 per cent) and the United States. Belfast, Dublin, Cork, and Limerick are the chief ports. The chief exports are live stock (horses, cattle, sheep, and pigs), bacon, hams, pork,

poultry, eggs, butter, spirits, beer, fish, flax, raw wool, biscuits, margarine, hides, skins, textile goods (linen), ships, machinery, and motor-car parts; and the chief imports are wheat, maize, wheatmeal and flour, hops, sugar, meat, tea, coffee, wine, coal, timber, seeds, cotton piece goods, clothing, boots and shoes, hosiery, soap, motor-cars, leather goods, metal goods, machinery, and raw materials for manufacture (barley, oats, flax, wool).

Trade Centres. Ireland possesses few large towns. The chief are: *Dublin* (419,000), the capital of the Irish Free State and the chief commercial centre; *Belfast* (415,000; with suburbs, over 500,000), the capital of Northern Ireland and the chief industrial and commercial centre; *Cork* (78,000), the chief commercial centre of the south; *Londonderry* (45,000), the second town of Northern Ireland;

Limerick (40,000), the largest city of the west; *Waterford* (27,000), an important railway junction and packet port; *Kingstown* (19,000), the outport of Dublin; *Drogheda* (12,700), the bridge port of the Boyne; *Dundalk* (14,000), an eastern port; *Galway* (14,200), a western port and fishing centre; *Kilkenny* (10,000), an agricultural centre; *Lurgan* (12,500), a linen centre; *Lisburn* (12,400), a linen centre; *Portladow* (12,000), a linen centre; *Wexford* (11,900), a small eastern packet port; *Tralee* (10,500), the chief town of Kerry; *Sligo* (11,400), a western port and fishing centre; *Clonmel* (10,000), a railway centre; *Queenstown* (Cobh, 8 000), the outport of Cork; *Bray* (8,000), a watering place; and *Larne* (8,000), a passenger port.

Time. The time used in Ireland—Dublin time—is twenty-five minutes behind Greenwich time.

Position, Area, and Population. France (212,895 square miles; 41,020,000 population, 51 per cent rural, 49 per cent urban) is a massive, roughly hexagonal-shaped country, in the centre of the land mass of the globe. To the north-west it is bounded by the English Channel and the North Sea; to the west by the Atlantic; to the south by the lofty Pyrenees and the sunny shores of the Mediterranean; to the east by the towering ridges of the Alps and Juras and by the River Rhine; and only in the north-east is there no natural barrier, and here through the centuries have poured invading hordes. By the Treaty of Versailles (28th June, 1919) France regained Alsace and Lorraine, lost in 1871, and secured the Saar coal output till 1935. Emigration is small and the population remains practically stationary. Less concentration on industry and more on agriculture result in a more even distribution of the population than in Britain. France has long been the light-bearer of culture to others, a culture gained from the European Plain and from the Mediterranean Sea. From the former the French gained energy, persistence, endurance, and earnestness; from the latter vivacity and artistic skill.

Coast Line. More than half of the frontier of France is sea-coast (Atlantic, 1,304 miles; Mediterranean, 456 miles). In the east, the Channel coast is bounded by steep chalk cliffs, in the gaps of which are the ports of Boulogne and Dieppe; while, farther east, Calais and Dunkirk stand on dune-fringed alluvium. The rias of Brittany provide good harbours, and Cherbourg and Brest are fortified naval harbours. The Biscayan coast has flat sandy shores, broken by the Loire and Gironde estuaries. From the Point de Grave to the Spanish frontier stretches a long line of sand dunes, backed by the heath country or "Landes" of Gascony, rich in pines, to which the name of the Côte d'Argent is assigned. The rocky eastern half of the south coast, known under the names of the Côte d'Azur and the Riviera, is broken by the beautiful bays of Hyères and Nice, and by deep gulfs, which make admirable harbours, notably those of Marseilles and Toulon; but the western half is a line of dune-fringed lagoons.

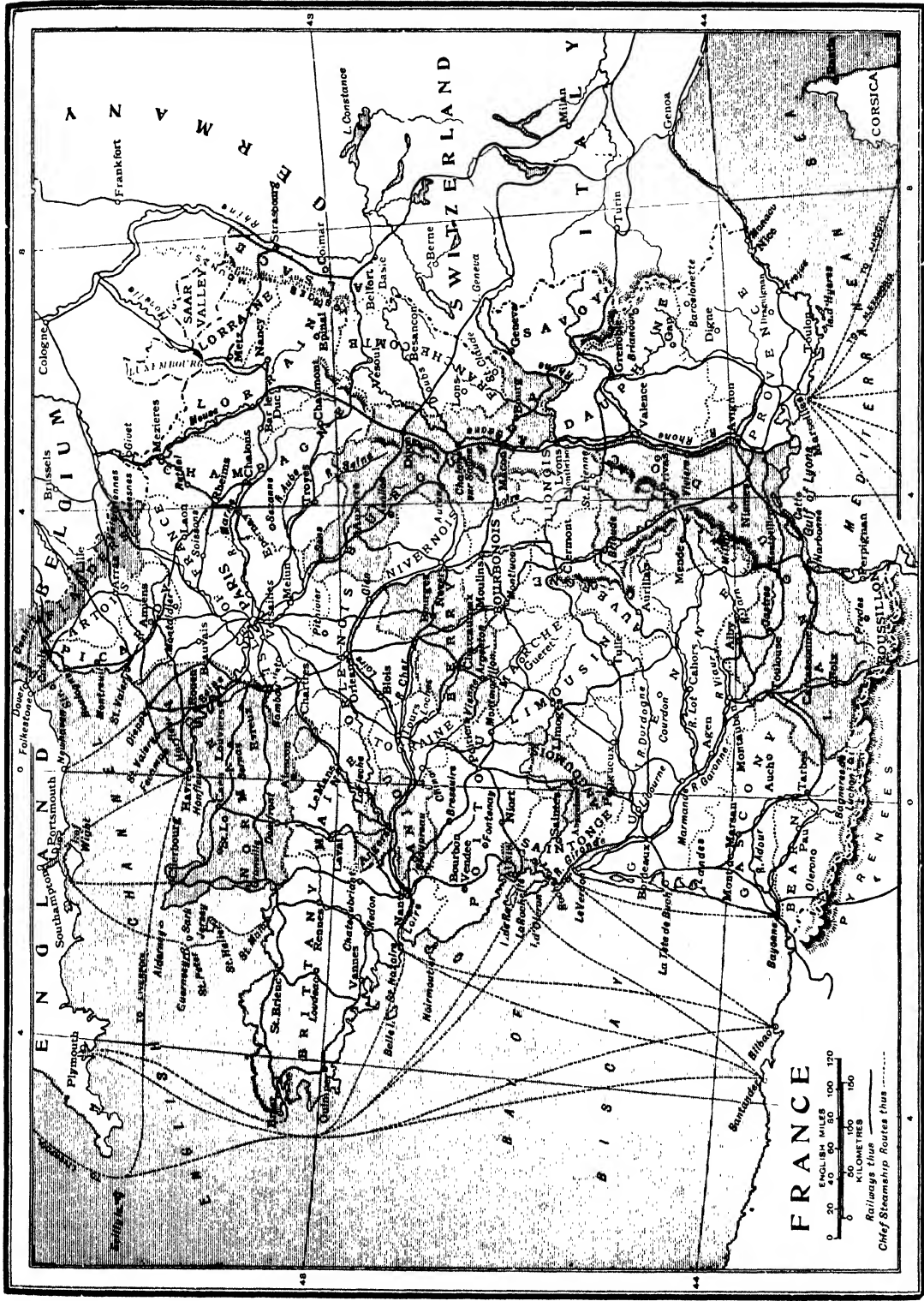
Relief. France has a highland core, the Central Massif, an old crust-block girdled almost continuously by lowlands of varying width, drained by the Seine, Loire, Garonne, and Saône-Rhône; and this is flanked southward by the young folded mountains of the Alps and the Pyrenees, and northward by the old plateaux of Brittany and the Ardennes. The mean height of France is about 1,000 ft., but more than one-half of the country is much below 650 ft. In its central part, the Central Massif culminates in the denuded cones of Cantal and Dore (about 6,000 ft.); in its north-west portion are the well-preserved cones of the Auvergnès; and in the east and south it presents the steep scarp of the Cevennes to the Rhone Valley and the Mediterranean. The Paris Basin, a bowl-shaped depression, rimmed on the east and south by a series of escarpments, includes the basin of the Seine and the Somme and a portion of the Middle Loire, and its symmetrical river systems provide a series of natural routes converging on Paris. Between France and Italy the boundary follows the watershed between the Rhone and the Po river systems, and, therefrom, the crests of some of the south-western Alps. The forest-covered Vosges Mountains in the east consist

of several parallel ranges running north and south, 4,000 ft. to 5,000 ft. high, with deep, narrow valleys between them.

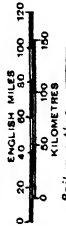
Climate and Vegetation. Five climatic types may be distinguished. The Central Massif has bitter winters (90 to 100 days of frost), great seasonal range of temperature, a mean annual temperature of 52° F., extremely hot summers, and an annual rainfall of over 60 in., falling mostly in summer. Brittany has the same average temperature and rainfall as the Massif, but its climate is of a pronounced maritime type. Its summers are cool and cloudy, its winters mild and wet. Aquitaine has the same mild winters as Brittany, but hotter summers, a higher average temperature (54° F.), and a lower rainfall (25 in. to 40 in.). The Paris Basin has a rainfall varying from 20 in. to 40 in., evenly distributed throughout the year, colder winters and hotter summers than in the London Basin, and its coastal belt is typically oceanic in its climate. The Mediterranean area has hot, dry summers, and exceptionally mild, wet winters. It suffers from the fierce north *mistral* drawn down the Rhone-Saône corridor, except the Riviera, which is sheltered from it by the northern mountain wall.

France is largely a land of oak and beech forests, of green pastures, and carefully cultivated fields. As in Britain, deforestation has gone far, but afforestation now receives much attention. Coniferous forests are found on the Vosges, Jura, Alps, Central Massif, and Pyrenees; woods of maritime pine have been planted in the Landes; deciduous forests exist in the Ardennes and Champagne regions, and in the Isle de France, Burgundy, Morvan, Le Perche, and Picardy; and there are plantations of cork trees at the eastern extremity of the Pyrenees.

Land and Water Routes. The waterways, natural and artificial, of France have a length of 8,437 miles, and water transport is equal to one-third of the railway transport. On the east and north-east there is water communication with Switzerland, Germany, and Belgium, and there is considerable traffic in coal, iron ore, and pig iron with the two last named countries. The Rhone (507 miles) is of little commercial importance, but the Saône is a first-class waterway, connected by first-class canals with the Seine, Rhine, and Meuse. The Seine (485 miles) and its chief tributaries, the Yonne, Marne, and Oise, rise in the hills of Burgundy and Champagne and the Ardennes. The whole system converges on the Paris region, whence the main stream flows northward to the English Channel. Steamers drawing 22 ft. can reach Rouen, and those drawing 10 ft. can reach Paris. First-class canals connect the Seine with the Rhone, Rhine, and Meuse, while smaller canals connect it with the Loire. The Loire (635 miles) with its tributary, the Allier, rises in the Central Massif, and flows to the Bay of Biscay. It is negligible as a commercial waterway owing to the shifting sandbanks at its mouth. A ship canal, cut to allow vessels drawing 21 ft. to reach Nantes, enables that town to compete with the rising town of St. Nazaire at the head of the estuary. The Dordogne and the Garonne (450 miles) draw their waters from the Central Massif and the Pyrenees, and converge on Bordeaux, entering the Bay of Biscay by the Gironde estuary. At Bordeaux the Garonne is 500 yd. wide, and its depth of 20 ft.



FRANCE



Railways (thick line)
Chief Steamship Routes (thin line)

allows large ocean-going vessels to reach the docks. From Toulouse on the Garonne the second-class waterway of the Canal du Midi passes through Carcassonne and Cette to the Rhone, thus connecting the Atlantic with the Mediterranean. The delta of the Rhone prevents navigation. Recently, however, a canal of maximum depth 10 ft. was opened between Marseilles and the Rhone at Arles. Marseilles, Havre-Rouen, Dunkirk, Bordeaux, Nantes-St. Nazaire, La Rochelle-Pallice, Cherbourg, Brest, St. Malo, Calais, Boulogne, and Dieppe are the chief ports.

From Le Bourget, near Paris, many great air routes radiate to the chief European centres and the French African possessions. The system of railways is very extensive (31,000 miles). Each of the great railways serves a separate portion of the country, and little overlapping of areas occurs. Railways now cross the Pyrenees, but the main through railway routes between Madrid and Paris use the gaps between the Pyrenees and the sea. The Northern Railway (2,600 miles) connects the Channel ports of Dunkirk, Calais, and Boulogne with Paris, and is, for the area served, the busiest of the French railways. The Western Railway (3,700 miles) connects Paris with Dieppe and Havre *via* Rouen, with Cherbourg *via* Caen, and with St. Malo *via* Rennes and Le Mans. From Rennes the line extends through Brittany to Brest. The Eastern Railway (3,100 miles) connects Paris with Nancy, and then extends to the German frontiers. Another branch through Troyes and Belfort is connected with the Swiss lines. The Paris, Lyons, and Mediterranean Railway (P.L.M., 6,000 miles) carries the most traffic and is the central artery of trade, connecting Paris and Marseilles. The Paris-Orleans Railway (4,600 miles) runs from Paris to Bordeaux *via* Orleans, Tours, Poitiers, Angoulême, and Courtes. The Southern Railway (2,600 miles) joins Bordeaux with the Mediterranean ports *via* Toulouse. From Bordeaux a line runs south through Bayonne and Hendaye at the western end of the Pyrenees, into Spain; while the line parallel to the Mediterranean coast passes round the eastern end and enters Spain at Cerbare. One set of metals on this eastern route gives through communication between Paris and Madrid. On the others there is a break of gauge on the frontier. The State Railway (2,750 miles) serves the region between Bordeaux and the Loire, Orleans, Tours, Poitiers, and Angoulême. The Neussargues-Béziers line traverses the Central Plateau by a series of great engineering works, including the viaduct of Garabit. On over one-third of the railway mileage electricity is the chief motive power.

Productions and Industries. *Agriculture.* For many centuries the great political power of France was based on the agriculture of its fertile lowlands, and this industry still engages over 40 per cent of the working population. Peasant proprietorship of very small holdings, best described as market gardens, is common. Of the total land under cultivation, 57 per cent is devoted to cereals (wheat, 15.0; oats, 9.0; rye, 2.5; barley, 1.75; buckwheat, 1.2; maize, 1.0 million acres), 30 per cent to forage, and 2 per cent to industrial crops. The production of wheat, grown in all parts, but especially in the Paris Basin and the middle basin of the Loire, is exceeded only by the vast plains of America and

Russia (annual production, 300 to 350 million bushels). Oats are grown in the same districts as wheat. Barley, associated with hops, supplies breweries in the north and east. Rye flourishes throughout the country; buckwheat in Limousin; and maize in the Pyrenees district, the Saône Valley, and the Garonne basin. Sugar-beet, for the production of sugar and alcohol, is cultivated largely on the plains of Flanders, Picardy, Brie, Beauce, and Limagne. Potatoes are widely grown in the north. Flax is important in Brittany, Anjou, Nord, and the Pays de Caux; hemp in Anjou; colza in the Pays de Caux and Nord; chicory in Nord and French Flanders; vegetables and fruits in Provence, Brittany, Agenais, Anjou, Pays d'Avignon, and Limagne; tobacco in the upper Garonne Valley and in Alsace and Lorraine; and Mediterranean fruits in the lower Rhone Valley and the Mediterranean regions. France is the greatest wine-producing country in the world, both in quality and quantity (annual production about 1,350,000,000 gallons). The best known districts are Champagne (Epernay, Reims, and Sillery, the chief markets); Burgundy (red and white wines of Dijon, Maçon, and Beaune); the valley slopes of the Garonne and the district round Bordeaux (clarets of Médoc and St. Estephe); and the Charente Valley (the finest cognacs and "fines-champagnes"). Cider is important in Normandy, where orchards alternate with pasture lands.

The pastoral industry ranks high. There are 13,500,000 cattle, 10,000,000 sheep, 2,600,000 horses, 5,000,000 pigs, 1,300,000 goats, 300,000 asses, 180,000 mules, and some millions of poultry. In the south goats largely replace the cow, and asses and mules displace the horse. Dairy farming and cheese-making flourish in Boulonnais, Lower Normandy (Camembert), Brittany (Prévalaye), the Central Massif (Roquefort), Vendée, Poitou, the Charentes, the Alps, Savoy, and Jura.

Fishing. The French fisheries directly employ 100,000 men afloat, and 60,000 persons on shore, and yield a total annual value of approximately £5,000,000. Boats from Fécamp, Dieppe, Boulogne, Dunkirk, St. Malo, Gravelines, Binic, and Granville ply their trade not only in the narrow seas, but as far afield as Iceland and Newfoundland. These northern ports are the chief markets for cod and herring. The ports of the north-western peninsulas are engaged in sardine, tunny, and mackerel fisheries. On the west coast, south of Brittany, from Camant to Sables d'Olonne, the sardine is supreme, and Marennes is a great oyster market. Lorient and Croisic engage in deep-sea fishing, and the old landward harbour of La Rochelle, displaced by La Pallice, now specializes in fishing. On the south coast the fishing grounds lie west of the Rhone, where the shallow seas are of the greatest extent. Tunny, sardines, and anchovies are caught, and Cette, the centre of the salt industry, is the chief fishing port.

Mining. By the recovery of Alsace and Lorraine, France has brought within her borders new and large resources in raw materials (oil, potash, coal, and iron ore), as well as large and highly-developed metallurgical engineering, and textile industries. The acquisition of the Lorraine iron mines, capable of yielding 50,000,000 tons of brown haematite yearly, has made France one of the leading iron-producing countries of the world. In 1913 France



produced 21,700,000 tons of iron ore; in 1931, over 52,000,000 tons. Iron is also obtained from Meurthe-et-Moselle (Longwy, Nancy, and Brieg), Cherbourg, Châteaubriant, Segré, and the Pyrenees (Ariège and Boucau). The valuable oil wells of Pechelbronn afford France some relief from foreign imports; the large Seille salt-field provides raw material for her chemical industries; and the potash deposits of Alsace (Wittelsheim), the greatest in the world after those of Stassfurt, aid both her agriculture and her chemical industries. Coal, unfortunately, is not abundant. The output is about 45,000,000 tons annually, and some 60 per cent has to be imported. The numerous scattered coal-fields include the group of the Nord and the Pas-de-Calais, and the small fields of the Central Plateau—Loire (St. Etienne), Burgundy, Nivernais (Le Creusot), Gard (Alais), Blanz, Tarn, Aveyron (Aubin, Carmaux), and Bourbonnais (Commentry). Saar coal (13,000,000 tons annually) and imported coke are needed for the blast furnaces and foundries. War-damaged mines have been provided with general plant, coal-getting equipment, and power stations of the best type. Some lead is found in Brittany, the Central Massif, and the Alps. Copper is mined in the Lyonnais and where the Meuse enters the Ardennes. Other minerals are zinc, antimony (Auvergne), arsenic, manganese, slate, phosphates, gypsum, and bauxite (Baux and Brignoles).

Manufactures. Striking changes in the post-war manufactures of France are the increase in mass production, the re-equipment of factories on the most up-to-date lines, and the provision of patent coke ovens with by-product recovery plants, which has made North France an important seat of the manufacture of ammonium sulphate and benzol, and of the generation of electrical power from the residual gases. The use of water-power has been greatly extended (3,000,000 h.p. developed), especially in the Alpine districts, and new processes have been adopted in the chemical industries. In Lorraine, on the north-east coal-field, in the Pyrenees, and at Paris, Lyons, St. Etienne, Bordeaux, Montluçon, and Caen, the metallurgical and engineering industries are growing rapidly. A foremost place has been gained in the automobile industry, centred at Lyons, Paris, and St. Etienne; and the production of agricultural machinery, electric furnace steel, machine tools, and special steels shows steady increase. In 1914 the devastated departments contained from 60 to 90 per cent of the spindles and looms used in the textile manufactures. These losses have been made good by the most modern types of machinery, and in the cotton industry France has increased her spinning capacity by 27 per cent, her weaving capacity 36 per cent, and her dyeing, bleaching, and printing capacities by 100 per cent. The natural silk industry carried on in the Lyons district and the artificial silk industry of the north-east coal-field, and the Rhone basin, are strongly established. Woollens are manufactured chiefly in the north, round about Lille, in the Ardennes (Sedan), in Champagne (Reims), in Poitou, Berry, and Languedoc, and at Lyons, Toulouse, and Bordeaux. The cotton industry is carried on in the north-east coal-field (Tourcoing, Lille, Roubaix, St. Quentin, and Amiens), the Vosges (Epinal, St. Die, Remiremont, and Senones), Alsace (Mulhouse and Colmar), and at St. Etienne, the Rouen district,

Nantes, Troyes, and Roanne. The neighbourhood of Paris is important for costly dresses, furniture, perfumes, "articles de Paris," jewellery, chemicals, and motor engines. Hemp and flax are woven in the department of Nord, and in Anjou, Maine, and the Dauphiné. Lille and Cambrai make linen, muslin, cambric, and lawn; and there is a large lace industry at Calais and Caudry. Marseilles has oil refineries, sugar refineries, soap works, and chemical works. Recently France has made noteworthy progress in the dyestuffs and chemical industries. Other manufactures are the gloves of Grenoble and Voiron; the paper of Angoulême; the guns of Ruelle; the flour-mills of Essones and Corbeil; the porcelain of Sèvres and Limoges; the carpets of Gobelines, Beauvais, and Aubusson; the mirrors of St. Gobain; the crystal of Baccarat; the sugar refineries of Nantes and Bordeaux; the ribbons of St. Etienne; and the clocks and watches of Besançon.

Commerce. In 1931 the imports totalled 42,200 million francs, and the exports 30,421 million francs. The chief exports are silk textiles, cotton textiles, wool textiles, iron and steel goods, machinery, wines, pearls, soaps and perfumes, automobiles, clothing, glass, rubber goods, table fruits, vegetables, raw silk and yarn, timber, brandy, liqueurs, millinery, artificial flowers, cheese, butter, potash, linens, chemicals, and fish; and the chief imports are raw wool, raw cotton, coal, oil-seeds, machinery, sugar, coffee, petroleum, cotton goods, iron and steel goods, hides and skins, raw silk, rubber, timber, copper, cereals, furs, flax, and cattle. The chief countries traded with are the United Kingdom, Belgium, the United States, Algeria, Switzerland, Germany, Italy, Argentina, Spain, Tunis, Morocco, and Indo-China. The United Kingdom sends coal, woollen goods, machinery, cotton goods, chemicals, and metal goods; and takes from France silk and woollen goods, artificial silk goods, fancy goods, wines, brandy, motor-cars, sugar, butter, leather, lace, fruits, vegetables, and eggs.

Trade Centres. There are seventeen towns with populations exceeding 100,000; but the *conurbations* typical of Industrial England are not found. *Paris* (2,891,000), the capital, and social and fashionable centre of Europe, is the crucible of thoughts that have helped to direct the civilization of the world; *Marseilles* (801,000), the chief port, trades with all parts of the world; *Lyons* (580,000) is the centre of the greatest silk-manufacturing district in the world; *Bordeaux* (263,000) is the centre of the richest wine district; *Lille* (202,000) is an important engineering and textile centre; *St. Etienne* (191,000) is second only to Lyons in silk manufactures; *Nantes* (187,000) trades with the West Indies and Central America; *Nice* (220,000) is a favourite Riviera winter resort; *Toulouse* (195,000) is the centre of rich grain-growing plains; *Strasbourg* (182,000) is a strong fortress and natural route centre; *Le Havre* (165,000) is the second port; *Rouen* (123,000) is the rival of Havre; *Roubaix* (117,000) is the principal wool market; *Toulon* (133,000) is the French naval base; *Nancy* (121,000) is an iron centre; *Clermont-Ferrand* (107,000) is an engineering centre; *Reims* (113,000) is a fortress and a wine market. Twenty-two other towns have populations exceeding 50,000. The chief are: *Mulhouse* (99,000), *Limoges* (93,000), *Amiens* (90,000), *Grenoble* (91,000), *Nîmes* (89,000), *Dijon* (90,000),

Calais (70,000), *Orleans* (72,000), *Brest* (70,000), and *Metz* (79,000).

Corsica (3,367 miles; 288,000 population), included as part of France, is an island in the Mediterranean Sea, south of Genoa, composed of hard crystalline rocks, forming high ridges, divided by secluded valleys. On the east is a marshy alluvial coastal plain of great fertility. Its climate is delightful and productive, but only one-third of the island is cleared and cultivated, while quite half of it is covered with impenetrable and useless evergreen scrub and thickets. The chief economic products are wheat, olives, wine, almonds, chestnuts, and citrus fruits. *Ajaccio* (25,000), the capital, and *Bastia* are the chief centres, the former having its trade and intercourse with France, the latter with Italy.

Foreign Possessions. The colonies, protectorates, and possessions of France cover an area of 4,537,000 square miles, with a population of 92,000,000.

In Africa. Algeria (now treated as an integral part of France), Tunis, Madagascar, Réunion, French West Africa, Senegal, French Guinea, French Ivory Coast, Dahomey, French Togoland, French Sudan, Upper Volta, 925,000 square miles of the Sahara Desert, French Equatorial Africa, French Somaliland, and Morocco.

In Asia. Syria (Mandate), French India (Pondicherry, Chandernagore, Karikal, Yanaon, Mahé), and French Indo-China (Cochin-China, Annam, Cambodia, Laos, Tong-king, Kwangchow Wan).

In America. St. Pierre and Miquelon off Newfoundland, the French Caribbees (Martinique and the Guadeloupe Group), and French Guiana or Cayenne.

In Australasia. New Caledonia, the New Hebrides Islands (joint British and French protectorate), the Society Islands, the Marquesas Islands, and the Tuamotu, Leeward, Gambier, Tubuai, and Rapa Groups.

Monaco (8 square miles; 23,000 population) is an independent principality, under French protection, lying between Nice and Mentone. *Monaco*, the capital; *La Condamine*; and *Monte Carlo* (casino) are the chief towns.

Mails and Time. Mails are dispatched to France from London several times daily *via* Dover, Folkestone, and Newhaven. Paris is distant 267 miles from London, and the time of transit is seven to eight hours. To Lyons the journey occupies twenty hours, and to Marseilles about twenty-four hours. Greenwich time is in use throughout France.

Position, Area, and Population. Belgium (11,755 square miles; 8,092,000 population) is a small, densely-populated triangular kingdom, lying between Holland and France. Flemings of the Teutonic race, tall and blonde, occupy the flat country of the north, crossed by the sluggish Schelde; while Walloons of the Gallic type, short, dark, and active, inhabit the southern plateau country, through which the impetuous Meuse forces its way. By law, the French and Flemish languages are of equal importance; but Flemish is spoken by the majority of the people.

Coast Line. The coast line is but 42 miles long, and this, in the main, is flat, low, and unbroken. Lines of sand-dunes, strengthened where necessary by artificial embankments, keep the sea from invading the lowlands behind. Good, natural harbours are absent; all have been, more or less, artificially made. Antwerp is a magnificent river port; Ghent a canal port; and at gaps in the system of dunes and embankments are Nieuport at the Yser western gap, Ostend at the central gap, and Zeebrügge at the eastern gap.

Relief. Generally speaking, Belgium is a flat, low-lying country, the northern half of it forming part of the Great European Plain. Four natural regions may be distinguished: the Lowland Region of the north and west, part of which is below sea-level, and has been gained from the sea and marshes by human efforts (this region is agricultural, and the polder or reclaimed land is of high fertility); the forested, mining, and rich hill region of the south and south-east, with the heights of Hainault and Hesbaye, and the old Ardennes plateau averaging 1,500 ft. in height; the Campine Region in the north-east—a plain of moor, marsh, peat bogs, and sandy tracts, producing a vegetation of broom and dwarf fir; and the dry, sandy heathland round Brussels and Waterloo. The chief rivers are the Meuse (550 miles; 100 miles in Belgium), the river of the mountains, and the winding Schelde (250 miles; half in Belgium), the river of the plains.

Climate. The climate of Belgium is largely influenced by its position, which makes it partake of an oceanic character, humid and cool, on its oceanic border; and of a continental character, hot summers, and extremely cold winters, on its eastern border. On the high plateau of the Ardennes, the mean annual temperature is only 45° F.; while that for the whole country is 50° F. The prevailing oceanic westerly and south-westerly winds meet no condensing obstacle except in the south and east, and, hence, the rainfall is most heavy in these regions. In the west the annual rainfall is 28 in., and fogs are frequent in winter. There are only about twelve days of unbroken sunshine in the year, and the number of rainy days averages 195.

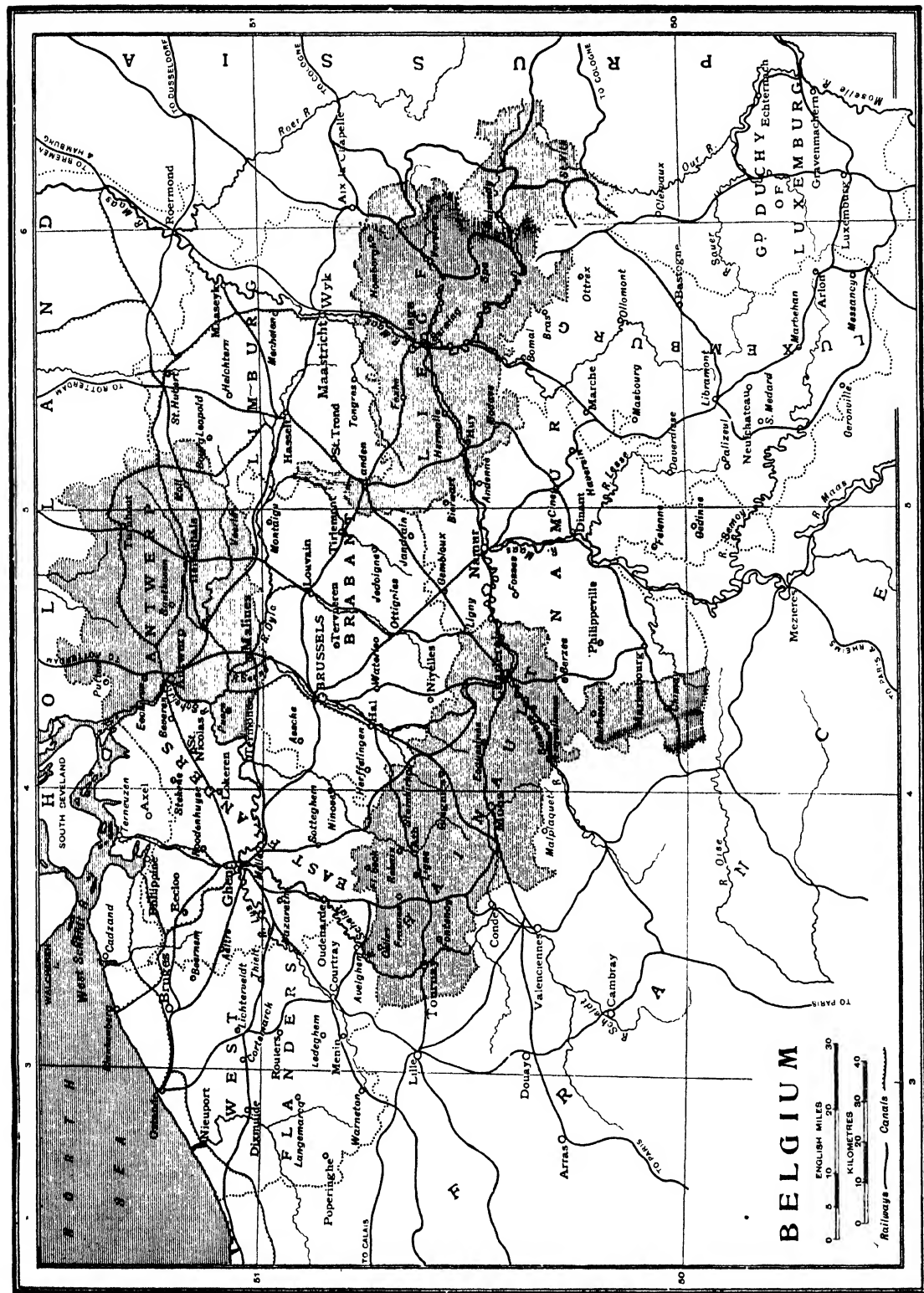
Land and Water Routes. The means of communication in Belgium are excellent. Splendidly made and well-kept roads, an intricate network of railways, and inland waterways of rivers and canals, make transportation both easy and cheap. Steam and motor traffic on the roads compete with the railway; and water traffic on the canalized rivers and canals is of greater extent than that on the railways. There is no town of importance that is without a canal. Artificial waterways connect Antwerp and Ghent with the Seine, the North Sea, and the mineral region of the south-west. Both

the Meuse and the Schelde are important highways of commerce, and they are connected with each other and with all the chief towns by a fine system of canals. Canals also connect the Meuse with both the Seine and the Rhine. The Sambre-Meuse route, which goes by Namur and Liège to Aachen and Köln, gives easy access from North-east France to the Rhine basin. Belgian railways compare with English railways as regards density, and they are owned largely by the State. The main lines, fed by a remarkable development of light railways, are international in scope. Mechlin (Malines) is the centre of the railways, and lines connect Antwerp with Brussels, Namur, Luxemburg, Strasbourg, Basle, and Milan (by the St. Gotthard Tunnel). From Brussels lines run south-west by Mons to Paris, west to Ostend through Ghent and Bruges, east by Liège to Köln (Cologne), and north-east through Antwerp to Rotterdam and Amsterdam. Regular air services ply daily between Brussels, Paris, and Berlin.

Production and Industries. *Agriculture.* Belgium ranks among the most intensive farming countries in the world. The Belgian peasant toils early and late on his small holding, using the spade more often than the plough, and obtains marvellous results. Not one-tenth of the country is waste land, and almost 60 per cent is under cultivation. Oats and rye are the chief cereal crops, largely on account of their ability to stand a more rigorous and rainy climate than wheat, which is mainly grown in the centre of the plain, where the soil is comparatively dry. Other crops of importance are barley (winter), potatoes, beet, tobacco, hops, chicory, flax (especially in the Lys Valley), hemp, colza, and madder. The cultivation of vegetables and fruit, and the keeping of poultry are of increasing importance. On the reclaimed tracts of the Campine, and on the fertile polders in the north-west, cattle are fed, and dairying is a very profitable industry. The best butter comes from the Campine district. Fine breeds of horses are reared in Flanders in large numbers, and the funeral "blacks" are well known. Sheep roam over the Ardennes pastures, and supply the woollen industry of Verviers.

Forestry and Fishing. Timber is abundant. About 16 per cent of the total area is forested, chiefly in the Ardennes. The oak is the most prevalent tree, but the birch, maple, beech, and lime are common. Herring and cod are caught in the North Sea, and there are oyster beds off the sea coast.

Mining. Minerals form one of the chief sources of Belgian prosperity. Coal (annual production, 27,000,000 tons; briquettes, 2,100,000 tons; and coke, 6,000,000 tons) and iron (annual production, pig iron, 4,100,000 tons; steel, 4,010,000 tons; wrought steel, 3,600,000 tons) are found in close proximity, especially in the south-east round Liège. The Belgian coal-field is a continuation of the French Valenciennes coal-field, and lies on the south of the Hainault-Hesbaye Heights, having as its chief centres Mons, Charleroi, Namur, and Liège. In 1901 coal was discovered at Lanaeken, in Limburg, at a depth of 1,770 ft. Local iron ore shows signs of exhaustion, and much ore is imported from Luxemburg and Lorraine. Zinc is mined at Verviers and Moresnet. Marble is plentiful, and that of Dinant is highly prized.



Manufactures. The manufactures are very advanced. For textile and iron manufactures the advantages are: locally-grown flax; the wool of the Ardennes; the proximity of coal and iron; specialized workers; a moist climate; the absence of hurtful lime salts in the waters of the rivers, notably the Lys (useful in bleaching); the splendid system of communications; and the situation of Antwerp for the receiving of the raw materials for manufacture. Cotton goods are manufactured at Ghent (Gand), the "Manchester" of Belgium, Bruges, Antwerp, and Courtrai; woollen goods at Verviers, Liège, Tournai, Ghent, and Courtrai; lace goods at Mechlin, Bruges, Brussels, and Antwerp; linen goods at Tournai, Courtrai, Ghent, and St. Nicholas; silk goods at Antwerp and Ghent; Brussels carpets at Brussels and Tournai; hardware at Liège (the "Leeds" and "Birmingham" of Belgium), Charleroi, Mons, Namur, and Seraing; and sugar and leather at Antwerp. There is much specialization in the iron trade. Liège specializes in ordnance; Namur in brass, wire, and cutlery; and Charleroi in nails.

Commerce. A large transit trade is carried on across Belgium (mainly through Antwerp, Liège, and Verviers) between overseas countries and the basin of the Middle Rhine. Though the sea-borne commerce of Belgium is great, yet its mercantile marine is small, and British vessels do a large amount of the carrying trade. The chief exports are textiles, machinery, glass manufactures, iron goods, steel, zinc, diamonds, sugar, lead, copper, butter, eggs, india-rubber, horses, chemicals, wheat, mixed grain, coal, and coke; and the chief imports are wheat, mixed grain, maize, barley, wool, flax, hemp, silk, cotton, wood-pulp, live animals, coal, iron ore, zinc, textiles, iron goods, machinery, chemicals, copper, nickel, diamonds, rubber, raw hides, oil seeds, coffee, skins, furs, and petroleum. Most trade is carried on with France, the United Kingdom, the United States, Holland, Germany, British India, Rumania, Argentina, and Belgian Congo. The larger half of the commerce crosses the land frontiers; the smaller half is by sea.

Trade Centres. Belgium is pre-eminently a country of cities, but its population is more evenly balanced between town and country than in England. *Brussels* (833,000), the capital, centres all the interests of the country; *Antwerp* (300,000) is the chief port; *Ghent* (211,000) is a town of rivers, canals, and bridges; *Liège* (168,000) is the chief iron manufacturing town; *Mechlin* (62,000) is the religious capital; *Bruges* (51,000) is a quaint canal and bridge town; *Ostend* (44,000) is the chief packet station; *Seraing* (45,000) is an engineering centre; *Verviers* (44,000) is a woollen centre; *Louvain* (40,000) is a university town; *Courtrai* (38,000) is a textile centre; and *Namur* (31,000) is an iron centre.

Foreign Possessions. *Belgian Congo* (918,000 square miles; 8,700,000 population; 24,000 Europeans), formerly called the Congo Free State, includes much of the Congo basin in Africa, and the Ruanda and Urundi districts of the former German East Africa. The chief productions are rubber, ivory, palm-nuts, palm-oil, gum copal, hides, copra, tropical fruits, sweet potatoes, millet, cotton, coffee, cocoa, sugar-cane, kola nuts, sisal hemp, kapok, copper, radium, tin, gold, and diamonds. *Léopoldville* (11,000) is the capital.

Luxemburg (999 square miles; 268,000 population). The Grand Duchy of Luxemburg, a small state within the Ardennes Upland, which attained separate autonomy in 1890, and is now within the Belgian Customs Union, is a small wedge of Teutonism, between the Walloon region of Belgium and the French Lorraine. Its strategic importance lies in its control of the Moselle line of invasion between Germany and France; and its economic importance lies in its iron mines, situated in the south-eastern corner of the state with Esch as a centre. The annual output of iron ore is more than 6,500,000 tons, and the foundries turn out 700,000 tons of steel. *Luxemburg* (50,000), a dismantled fortress, is its capital.

Time. Brussels is 224 miles distant from London; and the time of transit is about eight hours. Greenwich time is used throughout Belgium.

Position, Area, and Population. Holland, or the Netherlands (12,693 square miles; 7,921,000 population), lies to the west of Germany, and to the north of Belgium, with the North Sea on its western and northern sides. Much of it is really the delta of the Rhine, Maas, and Scheldt; and it is to its position at the mouths of the rivers and the consequent ease of communication with the large population in western Europe, on the one hand, and of the presence of the sea on the other, that Holland owes its importance.

Climate and Vegetation. While the winters are longer and more severe than in England, the climate, owing to the nearness of the North Sea, across which blow the prevailing winds, may be described as equable and moist. In winter the canals are frozen, and traffic is carried on on the ice. The annual rainfall scarcely exceeds 28 in., but humidity is high (usually over 80 per cent), and mists are common in the more dusty parts of the country. The mean annual temperature (50° F.) is essentially temperate, south-west winds raising the temperature for nine months, and north-west winds lowering it for the three months of summer. About 60 per cent of the country consists of clay soil, reclaimed from the sea or lakes, or deposited by rivers in the course of time. The remainder, mainly in the south and south-east, is sand, gravel, or peat; and here the heaths, woods, and hillocks are in striking contrast with the typically flat Dutch landscape found elsewhere.

Relief and Rivers. As it is to-day, Holland is a monument of human energy working in conjunction with natural forces. For ages the rivers have brought down vast quantities of clay and sand, the off-scourings of the Alps and the block mountains of Europe, and have formed banks in the shallow seas off the shore, gradually enclosing, more or less completely, areas flooded only at high water. By extending and strengthening these natural barriers so as to enclose completely the areas from the sea, a larger and larger country has been formed. These low-lying districts, called polders, have no natural drainage, and are liable to be flooded from the higher land, and even from the sea. To prevent this, great care is bestowed on the protecting dykes, and the water which accumulates is pumped out, to a great extent, by wind, steam, and electric power. Altogether, the area reclaimed and lying at or below the sea-level amounts to one-third of the country. A great scheme is now in progress of reclaiming large tracts of the Zuider Zee by means of a dyke from the coast of North Holland to the island of Wieringen, continued to the coast of Friesland.

Along the whole of the coast from the mouth of the Rhine to the Zuider Zee is a line of sand-dunes, mostly natural, but in parts artificially strengthened. This line, broken in places, runs northward to the Zuider Zee, and then eastward through the Frisian Islands, and southward through the islands of Zeeland. If the Dutch had not taken special precautions against the sea, not less than 38 per cent of the total surface of the country would be flooded with absolute regularity twice every day. The remaining part of the country is only a few feet above sea-level, and only 2 per cent of the surface is higher than 150 ft. To the north-east of the Zuider Zee are some hills rising to a height of nearly 300 ft., the highest (1,000 ft.) being in Limburg. The local rivers are small and unimportant. The Waal and the Lek,

distributaries of the Rhine, carry four-fifths of the river trade of the country, and are international waterways.

Land and Water Routes. All transport, except that of an urgent nature, is by means of the unique system of canals and waterways. The canals are managed so economically that the railways get only a small proportion of the goods traffic. Barges, which are increasingly driven by motor power, transport garden produce to the big towns. Sea-going ships discharge part of their cargoes into river boats, which serve even for transport to the Rhineland and to Belgium. There are 2,000 miles of canal and 1,100 miles of navigable river, and almost one-tenth of the population lives on barges. Ship canals have been constructed to accommodate vessels drawing from 10 ft. to 25 ft. of water. The North Holland Canal joins Amsterdam with Helder. This is less used now, owing to the construction of the North Sea Ship Canal (31 ft. deep), which joins Amsterdam with Ymuiden and brings Amsterdam within 15 miles of the North Sea. The New Waterway is the canal between the sea and Rotterdam. Near the mouth is the Hook of Holland. The South Beveland Canal leads to the Scheldt, and the Merwede Canal (10½ ft. deep) joins Amsterdam with Vreeswijk on the Lek, and thence with Gornichen on the Waal. The King William Navigation Canal leads from the Zuider Zee to Groningen; and there are also canals between Groningen and Harlingen, and Groningen and Delfzijl.

The railways (2,405 miles) are run by companies controlled by the State. They are connected with the systems of the adjacent countries at several points in the east and south, and three international railway thoroughfares connect with shipping services from England: Hook of Holland and Rotterdam to Berlin; Hook of Holland and Rotterdam to Basle; and Flushing to Basle and Vienna. Regular air services are run to London, Paris, and Berlin.

Production and Industries. *Agriculture.* Farm crops are raised on 26½ per cent of the surface, and engage 27 per cent of the wage-earners; 2½ per cent is applied to horticulture; 36 per cent is grazing land; over 7 per cent is forest; and the remainder is waste land in process of redemption. Intensive cultivation and small holdings are the rule. The fertile maritime clays produce hops, sugar-beet, tobacco, wheat, barley, oats, beans, flax, mustard, caraway seeds, chicory, and onions; and the light sandy soils yield rye (the chief crop), buckwheat, and potatoes. Bulb culture is important in the west, where the necessary sand, pure water, protection from salt-bearing winds, and black peaty subsoil enable Haarlem to display its glorious April bulb-fields. Famed also are the nurseries of Boskoop, the blooms of Aalsmeer, and the cold frames of the Westland gardens. The favourable pasture conditions encourage the rearing of cattle for the production of butter and cheese rather than meat. Dairying is most important; butter and cheese are excellent; and co-operative methods are well established. Butter is most prominent east of the Zuider Zee, the product of Groningen being considered the finest; whereas on the west of the Zuider Zee easier access to salt and slightly slower changes of temperature cause cheese to predominate, Edam and Gouda contributing enormously to the great cheese market of Alkmaar. Cattle and horses are

typical of the heavy lands of the west, and sheep and bees of the heath lands of the east.

Fishing. Over 27,000 people are exclusively engaged in fishing. The deep-sea fisheries are worked from Holland proper, and are mainly concerned with catching herrings in drift-nets in the North Sea near the Scottish and English coasts, and in the English Channel. Ymuiden, Vlaardingen, Maassluis, Scheveningen, and Katwijk are the principal centres. Dutch herring are excellent, and find a ready market in Germany, the United States, Belgium, and Poland. Frisians and Zeelanders are interested in the coastal and river fisheries. The principal catches are a small kind of herring, anchovy, eels, shrimps, oysters, mussels, salmon, pike, and carp; and there is a large export to France, England, Germany, Belgium, and Scandinavia.

Mining. Mineral wealth is not great, apart from coal, peat, and clay. Some 13,000,000 tons of coal are obtained annually from the South Limburg, the North Limburg and South Peel, and the Winterswijk coalfields, which have reserves of 3,400,000,000 tons.

Manufactures. About 35 per cent of Holland's wage-earners are engaged in industry, notwithstanding the fact that manufactures depend in some degree on imported coal. The manufactures are located mainly on the seaboard, or where there is easy access to German or Belgian coal. Cotton manufacture is the principal textile industry. Twente (Enschede and Almelo) in Overijssel specializes in cotton spinning, North Brabant in cotton weaving, and Roermond and Helmond manufacture mixed cloth and wool textiles. Blankets and friezes are manufactured at Leyden and Tilburg; carpets at Deventer; linen and brown "Holland" at Tilburg and Haarlem; calicoes and rich damasks in Overijssel; carpets, silk stuffs, and yarns in the neighbourhood of Utrecht; and firearms and glassware in South Holland. The metal industry is growing. Machinery, especially for shipping needs, is made chiefly along the lower part of the river Maas. Dutch tiles and pottery, notably Gouda ware, are held in high esteem. Colonial imports fix the tobacco, quinine, and diamond-cutting industries in or near Amsterdam. Schiedam is noted for "Hollands" gin, and Rotterdam for the curaçao liqueur. A large amount of alcohol is made from potatoes and sugar-beet, and the country is one of the chief refineries of beet-sugar, Rotterdam and Amsterdam being the great centres. Dairy produce is treated scientifically, preserved milk and margarine being important exports. There are shipbuilding yards at Amsterdam, Rotterdam, and Flushing, and the electrical industry is making progress at Eindhoven and Amsterdam.

Commerce. Transit trade, entrepôt trade in colonial produce, and general foreign trade amount to the greatest per head of population of any country in Europe. Most of the trade is carried on with Germany, Great Britain, Belgium, the Dutch East Indies, the United States, and France, chiefly through the ports of Amsterdam, Rotterdam, the New Maas, Flushing, and the Hook of Holland.

Possibly, with the exception of Norway, Holland possesses the greatest tonnage of shipping per head of population. The chief exports are textiles, sugar, drugs, rice, silk goods, spices, iron and steel manufactures, margarine, leather, paper, butter, cheese, condensed milk, meat, fish, cocoa, gold, zinc, flax, tobacco, skins, seeds, and vegetables; and the chief imports are iron and steel goods, machinery, textiles, cereals and flour, coal, rice, coffee, oil seeds, spices, sugar, cocoa, paving stones, gold, silver, tea, copper, paper, tobacco, timber, hides, skins, manures, dyes, lard, and tallow.

Trade Centres. *Amsterdam* (752,000) is the largest town, the nominal capital, and the commercial centre of the country; *Rotterdam* (582,000) is the chief port, and the outlet for the Rhine-Westphalian industrial area; *The Hague* (437,000) is the administrative capital; *Utrecht* (154,000) is a route centre and agricultural market; *Groningen* (105,000) is a canal and shipping centre; *Haarlem* (119,000) is the centre of the bulb-growing and cut-flower industry; *Arnhem* (78,000) is the control centre of the canal system; *Nijmegen* (82,000) is an agricultural centre; *Leyden* (71,000) is a university town; *Tilburg* (79,000) is a textile centre; *Maastricht* (61,000) is a textile centre; *Dordrecht* (56,000) is a river port; *Leeuwarden* (46,000) is a cattle market; and *Delft* (49,000) is a cheese and butter market.

Colonial Possessions. The colonial possessions of Holland embrace an area of nearly 800,000 square miles, with a population exceeding 61,000,000. They comprise the Dutch West Indies, the Dutch East Indies, and Dutch Guiana or Surinam.

The Dutch West Indies comprise the islands of Curaçao (210 square miles; 44,000 population), Bonaire (95 square miles; 7,500 population), Aruba (69 square miles; 9,000 population), St. Martin (larger southern half, 17 square miles; 2,300 population), St. Eustache (7 square miles; 1,100 population), and Saba (5 square miles; 1,600 population).

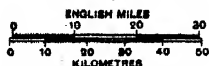
The Dutch East Indies. All the south-eastern islands of Asia, except the Philippines and parts of Timor and Borneo, are Dutch colonies, in which is also included the little-known western half of New Guinea. They lie between 6° N. Lat. and 11° S. Lat., and 95° and 141° E. Long., and have a total area of about 737,000 square miles and a population of 50,000,000, chiefly Malays, Negritos, and Papuans. The Dutch divide the islands into two sections: Java and Madura, and the Outposts (Sumatra, Riau-Lingga Archipelago, Banca, Billiton, Borneo, Celebes, the Molucca Archipelago, the Timor Archipelago, New Guinea, Bali, and Lombok).

In South America, *Dutch Guiana or Surinam* has an area of 54,291 square miles and a population of 149,000.

Mails and Time. There are three mail services daily between Great Britain and Holland, two *via* Flushing and one *via* Belgium. Amsterdam is about 250 miles distant from London, and the time of transit is twelve hours.

The railway time in use in Holland is twenty minutes in advance of Greenwich time.

HOLLAND OR THE NETHERLANDS



Railways — Canals —
Chief Steamship Routes - - -



Position, Area, and Population. Before the Great War the powerful German Empire had an area of 208,789 square miles and a population exceeding 65,000,000. Her population had increased over 40 per cent in a generation, her colonies had grown to the extent of 1,134,000 square miles, and she had obtained a leading position in the industry and commerce of the world. To-day, Germany is a federal republic (180,985 square miles; 63,200,000 population), consisting of seventeen states, and has lost all her colonies. As the most central country in Europe, Germany occupies almost the whole north and west of Central Europe, and extends from the Alps to the North and Baltic Seas. The driving and organizing force of the Republic is the Prussian of the Northern Plain, of Nordic stock, fair-haired and blue-eyed; while the dark-haired, dark-eyed Alpine of the south contributes largely to the wealth of German art, music, and literature.

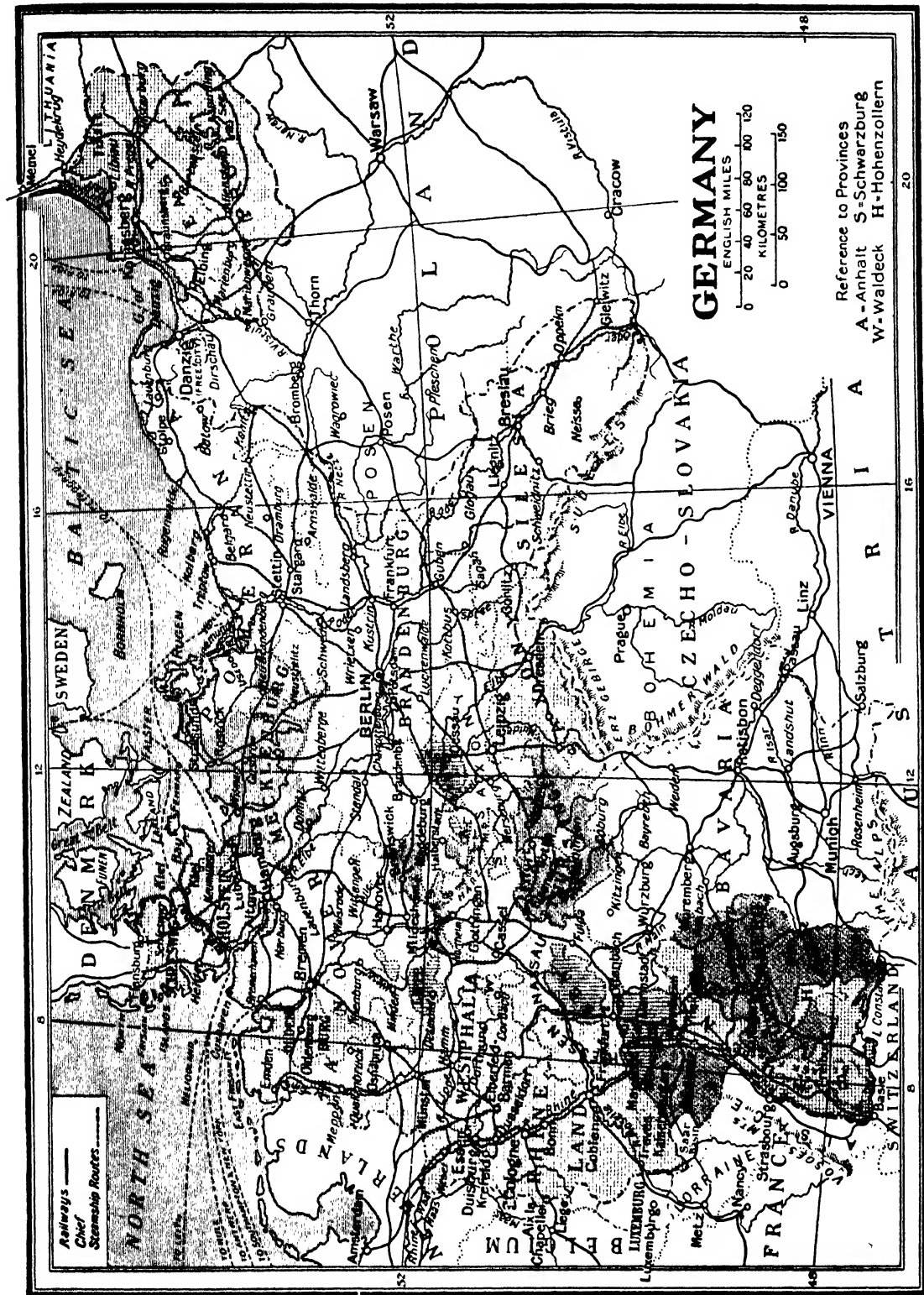
Coast Line. At the most liberal estimate, Germany has only about 1,200 miles of sea-coast, of which 900 are on the Baltic, a sea which has ceased to be one of the great inland seas of world trade. The short North Sea coast is much the more important, the Elbe and Weser ports alone owning some four-fifths of all German shipping. All the North Sea ports (Hamburg-Altona-Harburg, Bremen-Bremerhaven, Emden) are very difficult of approach, except through certain channels. On the Baltic coast sand deposits due to the currents have formed narrow spits (*nehrungen*), which enclose land-locked lagoons (*haffen*) of fresh water at the mouths of the rivers. In these the rivers are forming deltas; consequently the harbours at their mouths often depend for access to the sea on artificial channels. Kiel, Lübeck, Rostock, Stralsund, Stettin-Swinemünde, and Königsberg are all blocked by ice in the winter for a period varying from a month in the west to five months in the east, and their outlook is to Scandinavian lands.

Relief. On the southern borders of Bavaria the northern limestone Alps represent Germany's small share of the Alps, which in Zugspitze reach 9,700 ft. It is here alone that Germany extends into the region of eternal snow. From the Lake of Constance to the mouth of the Ill stretches the Alpine Foreland, a high plain, largely of morainic character. The Central Highlands, extending from Silesia to the Rhine, are a very highly complicated region of ancient folded ranges, worn down to their stumps and then uplifted, of fractured and tilted blocks, of basin-like depressions, and, in places, of past volcanic activity. The Lower Rhine Highlands are an uplifted ancient peneplain, through which the Rhine has cut a narrow gorge between Bingen and Bonn. The Rhine and its tributaries divide the highland mass into four groups, the Eifel and Hunsrück on the west, and the Westerwald-Rothaar and Taunus on the east. Along the whole of the northern scarp of the block the old rock is rich in metal, and overlooks a fertile lowland underlaid and flanked by coal. The southern scarp, rich in slate, is much less rich in metal and fuel than the northern. The Vosges (French) and the Schwarzwald, together with their northern extensions (the Harzt and Palatinate Hills and the Odenwald), once formed a single block, whose central part subsided between a series of parallel faults, and thus formed a rift valley, some 200 miles long and 20 miles broad, stretching from

Basle to Mainz, which constitutes the middle basin of the Rhine, a region of great fertility. From the mountain node of the eastern Fichtelgebirge radiate the Böhmer Wald, the Erz Gebirge, the Riesen Gebirge, the Sudetes, and the Moravian Heights, forming a highland framework for the low diamond-shaped Bohemian plateau. The Franconian and Swabian Jura, and the uplands of the Main and Neckar are scarplands, with the scarps looking to the north-west. The Harz Mountains, an isolated mass of ancient rock containing the Brocken (3,740 ft.), mark a continuation of the line of the Sudetes, as do the Weser Highlands (the Rhön and the Vogelsberg) lying farther north-west. The Northern Plain, the larger part of Germany, though low-lying and flat, is only in parts a complete low plain, composed mainly of sands and clays of glacial and alluvial origin. The details of its topography are intimately related to the action of ice in the Great Ice Age. Large areas, especially in the north-east, are covered with morainic lakes, and the successive frontages of ice, in advance or retreat, have left a series of concentric arcs of morainic hills more or less parallel with the Baltic coast. The most northerly of these hills, the Baltic Heights, run from Flensburg to Lötzen, and reach a height of over 3,000 ft. in the Turnberg above Danzig. In the east the lowest-lying area, the overflow of the rivers Oder, Spree, Havel, Netze, and Warthe has converted vast tracts of country into swamps. In the west are large expanses of moorland and heath, of which the best known are the Lüneberger Heide, the East Friesland Moor, and the Bourtanger Moor.

With the exception of the Weser, none of the larger German rivers lies wholly within the country. The Rhine enters from Switzerland, and its tributary, the Moselle, from France, and just after passing Emmerich, enters Holland on its way to the sea. A large part of Germany's trade, therefore, passes through Holland. The Elbe, however, carries a considerable amount of the trade of Czechoslovakia, but the Oder is of small importance. The Danube, rising in the Schwarzwald, has the greater part of its navigable bed outside Germany. Most important of all the rivers to Germany's trade and industry is the Rhine, which, unlike the other rivers, always maintains a considerable volume.

Climate and Vegetation. The climate is more or less continental everywhere, and four climatic areas may be distinguished: the north-west with warm summers and cool winters; the north-east with very warm summers and very cold winters; the south with very warm summers and cold winters; and the rift valley with hot summers and cool winters. The average annual temperature is 53° F. in the north-west, 49° F. in the centre, and 43° F. in the north-east; and the range of temperature increases more with distance from the sea than with distance from the Equator (42° F. in the north-east, 38° F. in the south, and 30° F. in the north-west). In January, the mean temperature varies from 22° F. in the east to 34° F. in the west. From west to east the rainfall decreases. On the higher parts of the west, from the Harz Mountains southward, the fall averages 34 in.; on the intermediate levels in the west and the higher parts of the east it averages 31 in.; and on the exposed lower levels of the north-east it averages 24 in., decreasing southwards. In the lowlands the rainfall varies from 28 in. in the west to



16 in. in the east; while in the higher south it ranges from 80 in. on the peaks of the Schwarzwald to 30 in. in the lower uplands of the east.

Of the whole area of Germany, 40 per cent is cultivated, 16 per cent consists of natural pasture, 26 per cent is forest-covered, and only 9 per cent is waste. Three-quarters of the forests are pine woods, which clothe the upper slopes of the Southern Highlands, and are also found in parts of the Northern Plain. The remainder is composed of mixed woods, the beech predominating in the Baltic and Weser regions, and the oak in the south and the Elbe and Oder valleys. Larch woods grace the Alpine districts; silver fir forests beautify the Schwarzwald, Thüringerwald, and the Sudetes; spruce woods cover the slopes of the Harz; and Scots pine is the characteristic tree of the Northern Plain.

Production and Industries. *Agriculture.* Germany, like Britain, though to a lesser extent, has become an industrial and commercial country rather than an agricultural. Except in a few districts, particularly in the west and south, the land is not very fertile, and the north and east abound in expanses of sand. Agriculture is, however, saved by the existence of a numerous and very efficient peasantry, working small farms on the intensive system. It is only in East Prussia that large estates are the rule. The principal cereal grown is rye (11,000,000 acres), still the food staple of the greater part of the population, and the main crop of the Northern Plain. Oats (8,800,000 acres) are widely grown, and hay (14,000,000 acres) is of great importance. Potatoes (7,000,000 acres) are produced most largely in North Germany. Sugar-beet (11,000,000 tons) is grown in Saxony, Silesia, Brunswick, Anhalt, and Bavaria, and is converted into sugar at Frankfort-on-Oder and Magdeburg. Wheat (3,700,000 acres) and barley (3,600,000 acres) are confined chiefly to the fertile regions of the Upper Rhine Plain. Barley for malting is in great demand. The south-western districts are best fitted naturally for the growth of the vine, hops, and tobacco. Maize is grown as fodder, as are also trefoil and lupin. Buckwheat is a product of the sandy soils of the north, and flax of the eastern Baltic lands. The raising of cattle (18,400,000), sheep (3,600,000), pigs (20,100,000), goats (3,000,000), and horses (3,800,000) on the extensive pastures and well-cared for meadows is an important part of German farming. The plains of the Alpine Foreland and of the north support most of the horses; while cattle, bred for beef and dairy purposes, are found everywhere from the coastal marshes to the Alps. Dairying is growing in the north-west and Kiel butter is well known. Sheep, owing to intensive agriculture and the growth of population, have greatly declined, and large flocks are now confined to the great estates of the north-east. On the other hand, pigs have largely increased owing to the large supplies of beet-refuse as food and the growing demand for pig products. Goats in the mountainous south, though reduced in numbers, are important for milk and cheese.

Fishing. The rivers, lakes, and lagoons provide a large proportion of the fish food consumed, and the fisheries of the North and Baltic Seas, stimulated by the excellent communications with inland markets, are very valuable and steadily progressing. Much attention is given to pisciculture.

Forestry. Germany's extensive woods and forests

are under careful supervision, and produce a large volume of timber, which is floated down the rivers as rafts to be dealt with at such ports as Mannheim and Ratisbon. The Harz and Thuringian forests, favoured with abundant soft wood and water-power, have important manufactures of paper in all its forms, and wood-carving, clock-making, and toy-making are typical industries of the forest areas.

Mining. Although Germany has suffered great losses of mineral-bearing territory in Silesia, Alsace-Lorraine, and the Saar district (13,000,000 tons of coal annually), she is still one of the foremost mining countries of the world. Of coal, the chief mineral, there are vast resources in the Rhineland-Westphalian (Ruhr), Aachen, Saxony, and Silesian basins. The annual production is about 151,000,000 tons. In addition to coal, there is an enormous output (166,000,000 tons) of lignite; and peat, found in beds varying from 3 ft. to 40 ft., is cut in large quantities. Iron-ore production has greatly declined owing to the loss of the famous minette mines of Lorraine, and Germany has now to enter the open market for some of her supply of iron. The home production (6,600,000 tons) comes from Westphalia, particularly the Ruhr district, certain areas of the Harz and Thuringia, and Upper Silesia. A large area, including the plains on every side of the Harz, contains enormous beds of rock-salt above or amongst deposits of potassium minerals, preserved by an extensive sheet of diluvium. These potash salts (12,500,000 tons annually) have enabled Germany to improve her agriculture, and lead in the chemical industry. The mining of precious metals is now small. Gold and silver are found in small quantities in the Fichtel Gebirge, the Erz Gebirge, and the Harz. Lead, copper, zinc, and tin ores are largely mined, and remunerative quantities of wolfram, manganese, bismuth, cobalt, nickel, and antimony are obtained.

Manufactures. Germany is again one of the leading manufacturing countries of the world. In the application of science to mass production she is the leader. Recently new and up-to-date plant and machinery and labour-saving appliances have been installed in many of the large factories. Much attention is given to the extended and economical use of lignite, the rapid expansion of electric power derived from lignite and falling water, and the scientific use of heating units to extract the greatest possible energy out of coal, oil, and other fuels. German organization, skill, and energy have regained for her most of the world markets lost during the war, and have largely rebuilt the mercantile marine. Germany has largely ceased to be a bulk exporter of raw materials and semi-manufactured products, and her future will probably consist mainly of finished goods. The principal seats of the iron and steel industry, which is well developed and steadily progressing, are in the Rhineland, Westphalia, Upper Silesia, and Saxony. In the first two of these are found the bulk of the great blast furnaces and steel works. The hub of industrial Germany is an area some 50 miles long by 6 to 16 miles broad, stretching in a south-easterly direction from the north of Essen to Siegen. Düsseldorf, Essen, Ruhrort, Duisburg, Dortmund, Gelsenkirchen, Remscheid, Bruchhausen, Bochum, and Solingen are the chief centres in the Ruhr. There is much specialization. Essen and Düsseldorf are noted for

heavy engineering; Solingen, Remscheid, and Tuttlingen for cutlery and hardware; Zwickau and Chemnitz for textile machinery; Magdeburg, Halle, and Frankfort for agricultural machinery; Dresden and Leipzig for sewing machines and pianos; Crefeld and Frankfort for ferro-alloys; and Magdeburg and Berlin for electrical goods. The chief shipbuilding yards are at Stettin, Lübeck, Kiel, Hamburg, Bremen, Vegesack, Bremerhaven, Rostock, and Elbing.

The cotton industry is less specialized, less localized, and on approximately half the scale of the British, the leading districts being Saxony (Chemnitz, Plauen, and Zwickau), followed by Westphalia (München-Gladbach, Barmen, and Elberfeld), Rhineland (Cöln), and minor towns in Silesia (Reichenbach) and South Germany (Augsburg). Somewhat of lesser importance than the cotton industry is the woollen industry, scattered through Saxony (Chemnitz), Westphalia (Barmen and Elberfeld), Thuringia, Silesia, and South Germany, and at Berlin and Aachen. Linen goods are produced in Westphalia, Silesia, and Saxony; silk goods in Crefeld and a number of other Rhenish towns; and artificial silk goods at Cöln and in the Black Forest region.

In the chemical and dyestuffs industry Germany is pre-eminent. Her advantages are the possession of large supplies of potash and other salts, the by-products of numerous coking ovens, much capital, technical skill, and research. In the by-products district the chief works are at Ludwigshafen, Essen, Leverkusen, Elberfeld, Höchst-on-the-Main, Frankfort-on-the-Main, Berlin, and Oppau; while in the Elbe basin, where the natural salts are found, Merseburg, Schönebeck, and Stassfurt are the leading centres. At Munich and Burghausen, Alpine water-power is used in the electro-chemical works. Germany not only leads in heavy chemicals, fertilizers, and dye-stuffs, but also in the purest pharmaceutical products, laboratory materials, and glassware.

Other manufactures are pottery and glassware in the Central Uplands, including Upper Franconia, the Upper Palatinate, and Thuringia, where, at Jena, excellent laboratory glass is made; paper at Düren and Aschaffenberg; porcelain at Meissen; tobacco at Hamburg and Bremen; beer at Munich, Stuttgart, and Karlsruhe; printing at Leipzig; boots and shoes at Pirmasens; fancy leather goods at Offenbach; toys in the hilly districts of Central Germany, notably at Nuremberg and Sonneberg; clocks and watches in the Black Forest region; and optical, astronomical, and mathematical instruments in the university towns.

Land and Water Routes. Communications by land, water, and air are well developed. The railway mileage is approximately 36,300 (33,500 State-owned). Undoubtedly the railway system is the best in Europe, and shows a close network in the industrial regions. Berlin occupies a central position in the railway system of Europe, a focus for north-south and east-west routes. The Orient Express route from Paris to Istanbul, after crossing the Rhine, runs along the base of the Schwarzwald; winds along the Neckar Valley, past Stuttgart and on to Ulm; and then proceeds through Munich to the Austrian town of Linz. Eastwards from Berlin there are three trunk lines. The most northern

crosses the Oder and Vistula to Marienburg; runs north-east to Königsberg, and thence to Vilna and Leningrad. The middle route passes through Thorn, Warsaw, and Smolensk to Moscow; while the southern, skirting the northern slopes of the Carpathians, leads through Lwów (Lemberg) to Odessa. Southwards from Berlin runs the important Nord-Süd express by Munich and the low Brenner Pass to Verona and Venice; and another route *via* Dresden leads through Prague (Prahá) to Vienna, which is also reached *via* Breslau. Westwards, a main line passes through Magdeburg to Cöln (Cologne), whence it is connected with the Dutch and Belgian ports, Paris, Basle, and the Alpine tunnels, of which the St. Gotthard is the most important to German commerce. On the north, Berlin is connected with Hamburg and Denmark, and with Stettin and the island of Rügen, whence train ferries run to Sweden. The Ostend-Vienna route proceeds through Cöln, Frankfort-on-the-Main, and Nuremberg (Nürnberg) to Ratisbon, and down the Danube into Austria.

The natural and artificial waterways (7,614 miles) are of great value to German commerce. Canal construction has been greatly facilitated by the general north-eastward direction of the rivers and their sharp right-angled bends in their lower courses, and it is possible for goods to be sent by water almost the whole way from the east to the west of the country. The westernmost angle of the Vistula is quite close to the Netze, a tributary of the Oder, and it is joined to it by the Bromberger Canal. Similarly, the Oder is joined to the Spree and the Havel by the Friedrich Wilhelm and Finow canals. In Bavaria the Ludwig Canal connects the navigation of the Rhine and Danube. A canal to connect the Main with the Danube is to be cut, so that small sea-going steamers will be able to sail across Europe to the Black Sea. The Dortmund-Ems Canal affords an outlet for the Westphalian industrial area through German territory, and has lessened the trade on the Rhine route to Rotterdam. With this canal the Weser is connected. The Kiel Canal accommodates the largest vessels. As high as Mannheim the Rhine navigation far excels that of all other German waterways, and next in importance to it is the Elbe system. Cologne is reached by light-draught sea-going vessels, and tugs and barges use the Rhine as far as Basle. Strasbourg, where the canals from the Marne and Rhone enter the Rhine system, is, however, the head of the important navigation. On the Ems, Weser, Elbe, and Oder the 600-ton barge is typical of the largest class.

From Berlin air services connect up with those of neighbouring countries, and there are extensions to London and Istanbul.

Commerce. The central position of Germany in the heart of Europe gives the Republic a great advantage in trading with the wealthy countries bordering her frontiers. Her North Sea ports, although not so well placed as those of Northern France and Britain, rank among the foremost world ports, Hamburg being the most important port of the European mainland. Most of the overseas trade is carried on through Hamburg, Duisburg-Ruhrort, Bremen, Rotterdam, and Antwerp, and is mainly with the United States, Great Britain, Central and South America, the West Indies, and British India.

Very important trade is also carried on with the neighbouring countries. Germany's exports and imports resemble those of Britain, but she is not so dependent on foreign food as Britain. The bulk of the export trade, with the exception of coal, is in manufactured goods, iron and steel goods and machinery easily ranking first, followed by textiles, chemicals, sugar, glass, scientific and other instruments, toys, pianos, wood manufactures, leather goods, and paper. Dairy produce, hides, and skins are also exported. The chief imports are raw materials (especially cotton and wool), foodstuffs (wheat, barley, cacao), coal, ores, and partly manufactured and wholly manufactured goods.

Britain exports to Germany cotton yarn, waste, and piece goods, woollen yarn and piece goods, iron and steel goods, machinery, coal, and fish; and imports from Germany woollen goods, machinery, hosiery, glass manufactures, dyes, toys, artificial silk, chemicals, electrical goods, and leather.

Trade Centres. *Berlin* (4,025,000) is the capital of modern Germany and of Prussia, and the greatest manufacturing centre of Germany; *Hamburg* (1,080,000) is a Free City and the leading port; *Cologne* or *Cöln* (701,000) is the largest port on the Rhine; *Munich* (685,000) is the greatest beer-brewing town in the world; *Leipzig* (680,000) is the most important printing and publishing centre in the world; *Dresden* (620,000) is a great industrial and commercial centre; *Breslau* (600,000) is an important agricultural market and industrial centre; *Essen* (629,000), the metropolis of coal land, contains the famous steel works of Krupp; *Frankfort-on-the-Main* (540,000) is an important banking centre; *Düsseldorf* (464,000) is a Rhine port and iron centre; *Hanover* (423,000) is a commercial centre; *Nürnberg* (*Nuremberg*) (393,000) is a great hop market and toy centre; *Stuttgart* (342,000) is a manufacturing and banking centre; *Dortmund* (525,000) is a coal-mining and iron-manufacturing town; *Bremen* (300,000) is the second port; *Magdeburg* (294,000) is an important collecting and distributing centre, and manufactures chemicals; *Königsberg* (286,000) is the chief port of East Prussia; *Duisburg-Ruhrort* (421,000) is the greatest transport centre of the Ruhr hardware district; *Stettin* (255,000) is the

chief Prussian Baltic port. *Mannheim* (248,000) is the great wholesale depot of South Germany; and *Kiel* (214,000) is the chief naval port on the Baltic.

Danzig. The Treaty of Versailles decreed that Danzig and the surrounding territory (754 square miles; 408,000 population, of whom 236,000 are centred in the city) should be a free state, under the protection of the League of Nations. Poland controls and manages the railways, the river and the docks, the trade, and the relations between Danzig and foreign states. The import and export duties are the same as those of Poland, but free transit for Germany is guaranteed. Danzig city lies on the left bank of the western arm of the Vistula, about five miles from the coast; while the territory separates East Prussia from the Polish Corridor. Danzig's exports are grain, timber, sugar, coal, and eggs; and its imports are textiles, herrings, iron ore, machinery, fats, and foodstuffs.

Colonial Possessions. By the dictated Treaty of Versailles (28th June, 1919) Germany lost to France the Reichsland of Elsass-Lothringen (Alsace-Lorraine), and the Saar coal-field till 1935; to Poland parts of Posen, Upper Silesia, and East Prussia; to Denmark North Schleswig; to Belgium Moresnet and Malmédy; and to Lithuania Memel City and adjoining territory. Danzig was made an independent city-state; and her vast colonies in all quarters of the world, developed with singular success by laborious effort and prodigious sacrifice, were surrendered. Togoland and Cameroon were allocated to Britain and France; German East Africa (Tanganyika Territory) to Britain; German South-West Africa to the Union of South Africa; the German Pacific possessions north of the Equator to Japan, and those south of the Equator to Australia and New Zealand.

Mails and Time. Mails are dispatched from the United Kingdom to Germany several times daily, and by various routes, according to the destination. The time of transit to Berlin, which is 652 miles distant from London by the Flushing route, is about 30 hours; to Cologne 24 hours, to Hamburg 30 hours, and to Munich 36 hours.

Mid-Europe time, which is one hour in advance of Greenwich time, is used throughout Germany.

Position, Area, and Population. The Republic of Switzerland (15,940 square miles; 4,066,400 population) is an inland country, bounded on the north by Germany, on the south-west and west by France, on the south-east by Italy, and on the east by Liechtenstein and Austria. Protected on all sides by immense mountain barriers, the Swiss have worked out their own destiny. The Swiss nation is composed of different nationalities, who came together as seekers after the right of self-determination, and retained in each case the language of the country of origin. German (71 per cent), French (21 per cent), and Italian (6 per cent) are not only spoken by the people in different districts, but are, also, the official languages.

Relief. Switzerland is essentially a land of mountains. The folded limestone Jura Mountains and the northern limestone and central crystalline Alps occupy five-sevenths of the country; while the Swiss plateau in the north, composed of sandstone partially covered by glacial deposits of the Ice Age, makes up the remainder. Italy is separated from the Republic by the Pennine (Monte Rosa, 15,217 ft), Lepontine, and Rhaetian Alps. On the west, the Jura Mountains form part of the boundary, and the Tyrolese Group acts as an eastern barrier. The central system, known as the Bernese Oberland, contains the Schreckhorn, the Jungfrau, the Wetterhorn, and the Finsteraarhorn. From the huge, low mass of the St. Gotthard, lying in the centre, the main river courses radiate. The Rhine flows northward through Lake Constance, which acts as its filter; the Rhone, rising in the great Rhone glacier, flows westwards through Lake Geneva; the Reuss and Aar join the Rhine (the former draining the lakes Lucerne and Zug, and the latter with one of its tributaries draining lakes Brienz, Thun, Neuchâtel, and Bienne); and the Ticino and Adige flow southward to the Plain of Lombardy.

Climate and Vegetation. In general, the climate is continental, with pronounced local variations due to aspect, prevailing local winds, and elevation. Lugano (900 ft., southern aspect) has an average annual temperature of 53° F., a range of 36° F. to 72° F., a winter of only three months, and a rainfall of 64 in. In the Upper Engadine (6,000 ft.) there is a range of over 90° F., and the winter lasts for six months. Cloudiness and rainfall are great. Windward slopes generally get more than 60 in. of rain annually (the Adula Alps get 90 in.); but Geneva has less than 33 in., and parts of Canton Valais have only 20 in. Perpetual ice and snow cover over 800 square miles at heights varying between 8,500 ft. and 10,000 ft.

The vegetation varies with the altitude. At the lower levels, vines, cereals, fruit trees, and vegetables flourish; deciduous trees stop at 5,000 ft., and the pine, spruce, and larch at 6,000 ft.; the juniper, in scrubby form, lives up to 7,000 ft.; summer pasture lands extend above the trees; and at 9,000 ft. even lichens are absent.

Land and Water Routes. Notwithstanding its mountainous character, Switzerland has excellent roads and railways. Of water transport there is little, because of the unsuitability of the rivers and the difficulties in the way of canal construction. Steamboats ply on the lakes for the tourist traffic. There are nearly 4,000 miles of State railway. Progress is being made with the electrification of the

railways, and light railways and motor-bus services are being multiplied. The great outlets for trade are: on the west, Geneva and Basle, which are joined by two lines of railway (1) through Neuchâtel and (2) through Lausanne and Berne; in the north-east, Zürich is the chief centre; a line from it through the Arlberg Tunnel (6½ miles) leads to Austria; and in the south the Simplon route by the Rhone Valley and the Simplon (12½ miles) and Lötschberg tunnels leads to the Toce Valley and Milan; while the St. Gotthard route from Zürich and Lucerne by the Reuss Valley and the St. Gotthard Tunnel (9½ miles) leads to the Ticino Valley and Milan. The main cross-line runs from Lausanne to Solothurn, Zürich, and St. Gall, by way of Neuchâtel or Bienne.

Production and Industries. *Agriculture.* Switzerland is largely an agricultural country, though more than a quarter of the land is classed as unproductive. There are about 300,000 peasant proprietors, and large holdings are discouraged by graduated taxation. Wheat, rye, oats, and potatoes, grown on the plateau, are the chief crops, but the bulk of the food crops consumed in the country is imported. The vine is cultivated in the sheltered valleys of the Rhone and Ticino, and in Vaud and Neuchâtel. Silkworms are reared in the Ticino Valley and in Grisons. Fruit trees and vegetables are important in the deep valleys opening to the south. Thirty-five per cent of the agricultural land is under grass and meadow. Cattle are much the most numerous of the animals reared (2,120,000). The higher pastures of the Alps are utilized in summer, and the cattle are driven to the valleys in winter. The remoteness of the pastures from markets causes the surplus milk to be made into cheese, or condensed and canned.

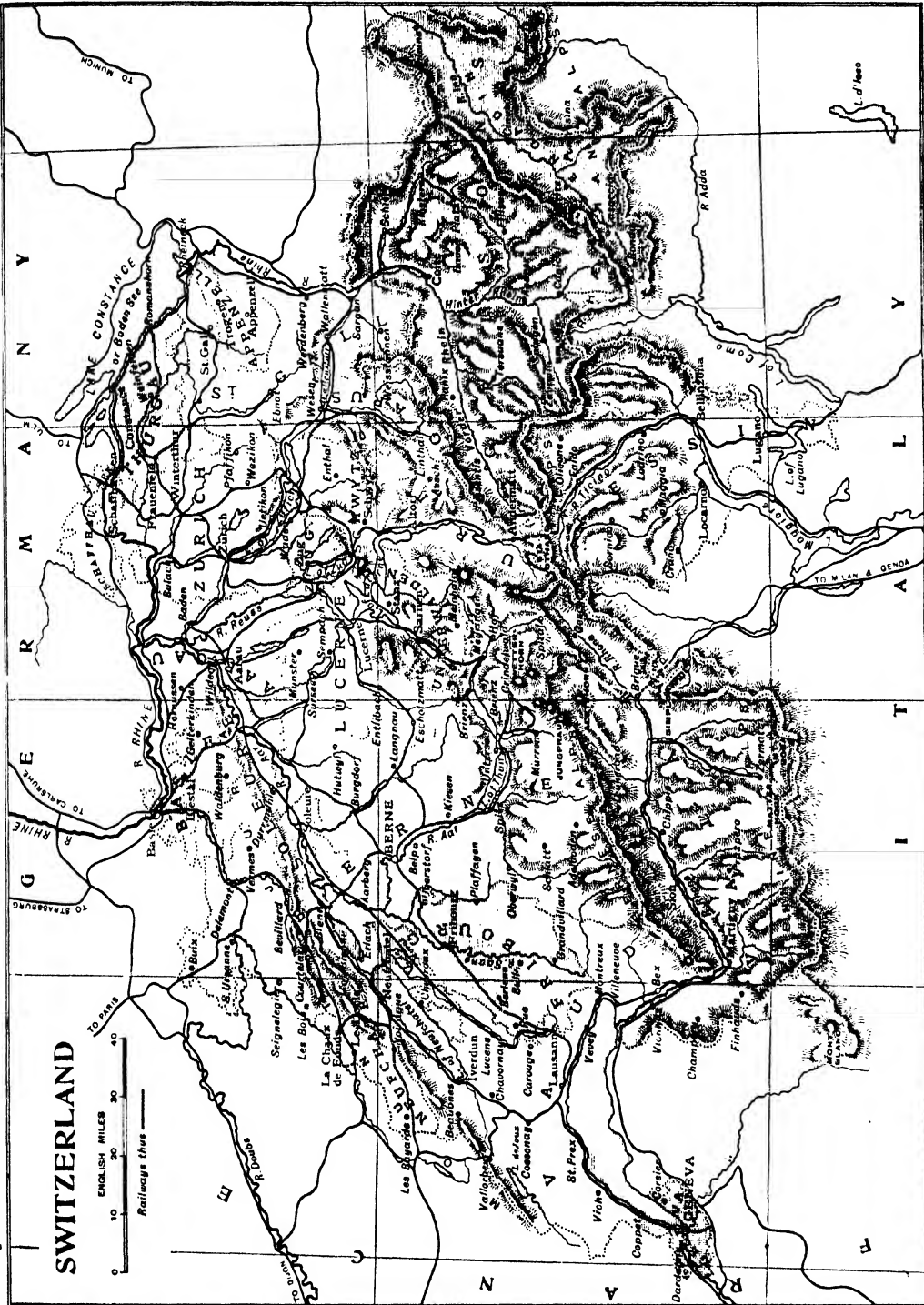
Mining. There is little mineral wealth. Salt is worked at Bex, Basle, and Aargau. Iron ore, in very small quantities, is mined in the Juras, and is known to exist near Meiringen. Asphalt is obtained at Val de Travers, Neuchâtel.

Manufactures. Swiss manufactures are well developed; factors to their success are the skill and energy of the people, the central position of the country, the excellent water-power, and the concentration on goods of high value and little bulk. Water-power is used in manufacturing, electric lighting, and for transport purposes. Cotton is the most important manufacture, and is carried on at Zürich, Glarus, Aargau, Appenzell, and St. Gall. The silk centres (natural and artificial) are at Zürich (silk in the piece), Basle (ribbons), and St. Gall. Machine embroidery and the making of lace are important in the cantons of St. Gall, Appenzell, and Thurgau. In the watch trade the Swiss compete successfully with the United States. Le Locle, Neuchâtel, La Chaux-de-Fonds, Geneva, Basle, Bienne, and St. Imier are the chief centres. Jewellery and the making of musical boxes are important in Geneva. Machinery and electrical appliances are made at Zürich, Basle, Berne, and Winterthur; and Basle is noted for its chemical industries, which include the production of aniline dyes. The uses made of water-power in recent years for the extraction of aluminium from its ores (Schaffhausen), and the making of calcium carbide are worthy of note. For the cheese industry, Emmenthal and Gruyère are the centres. Nestlé's milk and chocolate works are at Vevey. Many home industries exist, such as wood and ivory carving, straw-plaiting, lace-making, flax-spinning,

SWITZERLAND

ENGLISH MILES
0 10 20 30 40
TO PARIS

Railways thus ———



and weaving. The entertaining of visitors (*fremden* or "trading on foreigners") brings in some millions of pounds annually to both hotel-keepers and peasants.

Commerce. Most trade is carried on with Germany, France, Italy, the United Kingdom, the United States, and Japan. The chief exports are clocks and watches, cotton and silk goods, cheese and condensed milk, elaborated food products, machinery, hardware, chocolate, and fancy goods; and the chief imports are food products, and raw materials for manufacture; raw silk, cotton and wool, coal, metals, and minerals figure prominently.

Trade Centres. *Zürich* (250,000) is the chief industrial, commercial, and educational centre; *Basle* (148,000) is a silk and chemical manufacturing town; *Geneva* (143,000) is the chief town in French Switzerland; *Berne* (112,000) is the federal capital; *Lausanne* (76,000), *St. Gall* (65,000), and *Winterthur* (54,000) are manufacturing centres.

Mails and Time. There are three mail services daily between Great Britain and Switzerland, and the time of transit is about 22 hours to Berne, Zürich, and Geneva.

Mid-Europe time, which is an hour in advance of Greenwich, is used throughout Switzerland.

Position, Area, and Population. Before the Great War, the State of Austria-Hungary embraced an area of 261,259 square miles with a population exceeding 52,000,000. The new Republic of Austria, established by the Treaty of St. Germain, 10th September, 1919, is a grotesquely-shaped unit, only 32,369 square miles in extent with a population reduced to 6,723,000, of whom more than a quarter are congregated in Vienna. Briefly, Austria is a landlocked state, inhabited by South Germans, and embraces Lower Austria, Vienna, Upper Austria, Carinthia, Styria, Salzburg, North Tyrol, Vorarlberg, and Burgenland. It forms a bridge between western and eastern Europe, and between industry and agriculture.

Relief and Climate. Austria is essentially an Alpine country. The Great Central European Alps, crossing the frontier from Switzerland into Vorarlberg, continue their course eastward for 180 miles, and then descend into the Great Plain of Hungary. Mountain land covers over 92 per cent of the country; only 4.5 per cent is open country, and 3.2 per cent moderately hilly. The lowlands that exist are found chiefly in the Danube Valley, and in the Burgenland.

The climate is continental—the winters very cold, the summers hot. The rainfall is relatively heavy, owing to the mountains; but is variable as to both quantity and period, the total fall varying from 30 in. to over 80 in.

Communications. Railways (4,200 miles) are of prime importance. Unfortunately, the lines were designed originally to meet the military and commercial requirements of the former great Empire, and the needs of the present Republic are often ill-served. Most of the local lines necessarily run through Alpine lands, and thus involve enormous coal consumption. Efforts are, therefore, being made to electrify most of the system. Vienna is the central railway junction. Lines converge on it from the Rhine and South Germany by the Austrian Gate; from North Germany through Prague (Prahá); from Berlin, Breslau, and Leningrad through the Moravian Gate; from Trieste by the Semmering Pass; and from Istanbul through the Maritza and Morava valleys and Budapest. The grand trunk railways, the most important of which are the transcontinental lines, Paris-Istanbul, Berlin-Prague-Bucharest, and Warsaw-Trieste, handle the through traffic. Navigation is important only on the Danube, but Vienna's proportion of the river traffic enables the capital to compare favourably with many prosperous seaports. When the projected canals, intended to link up the Danube with the Rhine, Oder, and Elbe are completed, there will be an enormous extension of traffic. Austria is bound to play a leading rôle in the future organization of international communications in Europe. Air lines connect Vienna with Paris, Munich, Prague, and Budapest.

Productions and Industries. *Agriculture.* Outside Vienna agriculture is the leading occupation of the people. Wheat, rye, barley, oats, maize, and pota-

atoes are grown on the lowlands of Upper and Lower Austria, and on the plains of the Burgenland. Cattle are the chief animals reared, but there are excellent horses, and numerous goats, sheep, and pigs. In the well-watered Alpine regions dairying flourishes, and poultry farming is very popular in Upper Austria and Styria. Forests, mostly of pine-wood, cover an area of 12,000 square miles, and greatly help the revenue of the state.

Mining. The gold mines of the Hohe Tauern are second to those of Transylvania. Lignite (3,600,000 tons) is mined in Styria and Carinthia. True coal, in small quantities, is found in the Alpine provinces. Iron ore (2,000,000 tons annually) of excellent quality abounds, the principal mines being at Eisenerz and Hüttenberg. Rich deposits of magnetite are mined at Veitsch in North Styria and near the Millstätter Lake. Much salt is obtained in Upper Austria in the Salzkammergut; in Northern Tyrol at Hall; and in Salzburg at Hallein. A rich copper mine is worked near Mitterberg. Graphite is present in huge quantities in Styria and Lower Austria, and is largely exported. Kaolin, discovered in Upper and Lower Austria in 1920, has proved very important to the porcelain industry. Lead is mined in Carinthia; zinc in Carinthia, Tyrol, and Vorarlberg; and sulphur in Styria and Tyrol.

Manufactures. Manufactures are highly developed. Both raw cotton and wool are imported, but water-power greatly aids the textile industry; Steyr, Graz, and Klagenfurt are iron-manufacturing towns; Vienna has varied manufactures; and textile manufactures are growing in Vorarlberg. Fine leather is manufactured for the famous Viennese *Luxusware*. Cellulose is produced in large quantities at Hallein, and india-rubber products in the Semperit factory. Luxury articles are the products of large and small factories in Vienna. Toy-making and wood-carving occupy the peasants in the winter evenings, especially in the Tyrol.

Commerce. Trade is carried on with all the neighbouring lands, the Balkan countries, the Near East, France, Britain, and the United States. The chief exports are wood products, metal goods, machinery, paper, leather, animals, electrical appliances, timber, magnetite, glass, porcelain, pottery, and textiles; and the chief imports are foodstuffs, coffee, coal, textiles, raw materials for the textile manufactures, clothing, and agricultural implements.

Trade Centres. *Vienna* (1,857,000) is the capital, and the most important industrial and commercial centre; *Graz* (153,000), the capital of Styria, is an iron-manufacturing town; *Linz* (102,000) is an important railway junction; *Innsbruck* (56,000) is the capital of the Tyrol.

Mails and Time. Mails are dispatched to Austria from the United Kingdom three times a day. The time of transmission from London to Vienna, a distance of 955 miles, is about 30 hours.

Mid-Europe time is in use throughout Austria; that is, one hour in advance of Greenwich time.

Position, Area, and Population. The Kingdom of Hungary (reconstituted a kingdom in 1920), roughly an oval, is bounded on the south by Yugoslavia, and on the north by Czechoslovakia. Its territories have been greatly decreased through the transfer of Transylvania to Rumania, Croatia, and Slavonia to Yugoslavia, and Slovakia and Ruthenia to Czechoslovakia. The area of the state is 35,875 square miles, with a population of 8,684,000, of whom 80 per cent are Magyars. Territorial changes have deprived it of its coast line, and most of its forests, salt, iron ore, gold, and bituminous coal; but it is racially homogeneous. There is no middle class, and the peasantry and aristocracy, largely dependent on agriculture, rely upon the Jewish element for their trading organization.

Relief and Climate. Hungary consists of a great part of the south-eastern European Plain through which the Danube flows in its middle course. The Alföld, or plain of the Middle Danube-Tisza, has an average elevation of less than 350 ft., and is in the main a typical undulating grassland on deep alluvial soil and sand with low sandhills in the north and numerous lagoons diversifying in parts the prairie-like *puszta*s. West of the Danube stretches the hillier part of the country, and here is found the shallow Lake Balaton. Beyond the lake extends the rather low upland of the Bakony Forest. In the extreme north-west lies the fertile Little Alföld plain.

The climate is continental—hot summers and severe winters—the temperature ranging from 29° F. to 70° F. Most of the rain (20 in. to 24 in. annually) falls in summer, the moisture being drawn in off the Black Sea to a low-pressure centre over the sandy plains.

Communications. Though Hungary possesses 6,000 miles of railway—mostly single track—it lacks a sufficiency of rolling-stock. The Orient Express route crosses the country from north-west to south-east; and from Budapest lines radiate in all directions—to Vienna, Fiume, Belgrade, Bucharest, and Lwów. River communication (nearly 700 navigable miles) is chiefly along the Danube and the Tisza, which are both navigable throughout Hungarian territory. Steamers ply down the former river to Belgrade, and up-stream to Bratislava and Vienna. Freight can be carried for only eight months of the year, the rivers being frozen in the winter months.

Productions and Industries. *Agriculture.* The

country is predominantly agricultural. Lack of capital and transport difficulties largely prevent the practice of intensive cultivation, and farming methods are somewhat old-fashioned. Large estates are gradually being divided up, and a progressive policy is being adopted. The chief crops (figures in million acres) are: wheat, 3·6; maize, 2·5; rye, 1·7; barley, 1·1; oats, ·75; potatoes, ·62; grapes, ·55; sugar-beet, ·17; and tobacco. In several parts of the country there are notable vineyards, especially in the north-east in the hilly country of the Upper Tisza, which supplies the famous "Tokay" wines. Apples, pears, plums, apricots, and melons are grown in large quantities. Live stock is important (900,000 horses; 2,000,000 cattle; 2,000,000 sheep; and 2,700,000 pigs).

Mining. The mining of lignite in the Bakony Forest area is in a prosperous condition, 8,000,000 tons being raised annually, an amount sufficient for local needs. With the exception of the Pécs mine, in the south-east, there is no bituminous coal, and this commodity has to be imported. A little iron ore, found near Szeged, represents the remaining mineral wealth.

Manufactures. Hungarian manufactures are on a small scale. The chief are flour-milling, brewing, distilling, sugar, textiles, soap, leather, tobacco, and agricultural machinery.

Commerce. Most trade is with Austria, Czechoslovakia, Rumania, Yugoslavia, Switzerland, Italy, Poland, France, Germany, Great Britain, and the United States. The chief exports are flour, animals, machinery, wine, meat (fresh and preserved), wool, feathers, eggs, sugar, poultry, corn, and hides; and the chief imports are textiles, wood, coal, tanned hides, paper and paper goods, raw metals, machinery, iron and steel goods, mineral oil, soap, colonial wares, tea, and coffee.

Trade Centres. The chief towns are: *Budapest* (1,005,000), the capital and the chief commercial and industrial centre; *Szeged* (135,000), the principal commercial centre of the Alföld; and *Debreczen* (117,000), the great market centre of the northern Alföld districts.

Mails and Time. Mails are dispatched to Hungary from the United Kingdom three times a day. The time of transmission from London to Budapest, a distance of 1,126 miles, is about two days.

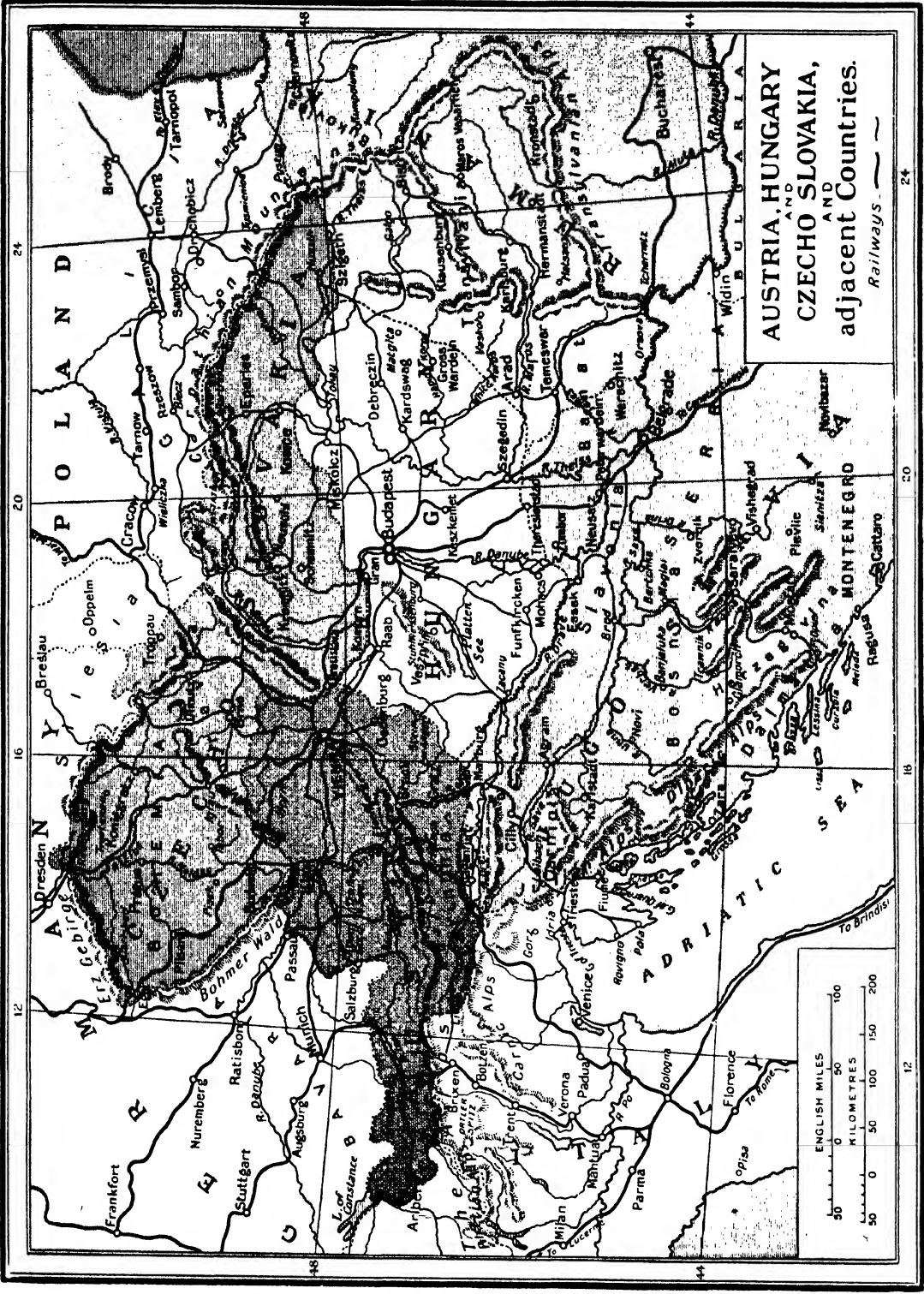
Mid-Europe time is in use throughout Hungary; that is, one hour in advance of Greenwich time.

POLAND

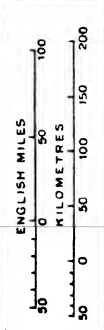
Position, Area, and Population. The Central European Republic of Poland (139,868 square miles; 31,928,000 population), recognized by the Powers, 28th June, 1919, embraces Congress or Russian Poland (43,504 square miles), Prussian Poland (30,481 square miles), the Vilna Territory (5,200 square miles, added in 1923), and part of Upper Silesia and East Prussia (decided by plebiscite). Some of her boundaries are indeterminate, and in Upper Silesia are bad, passing between water works and sewage works, and between the shafts and the workings of coal-fields. It is not yet clear what part Poland is destined to play as a political and economic unit. The divergent elements of her population (Poles, 20; Ruthenians, 5·3; Jews, 2·6; Russians, 2·6;

Germans, 1·0; figures in millions) have yet to be welded into a united state to secure economic and political stability and development. A serious problem is provided by the Jews, who largely control the trade and finance of the country, and are keen pro-Germans.

Relief. The surface of the country is generally uniform, with a lower average altitude than most European countries. Four different regions may be distinguished: the southern mountain border, a narrow region formed by the forested ridges of the Carpathians; the southern plateaux, including the Carpathian Foreland, where the higher parts are broad uplands divided by river valleys, among which the largest and broadest are those of the



AUSTRIA, HUNGARY
AND
CZECHO-SLOVAKIA,
AND
adjacent Countries.
Railways. —



Vistula and the Dniester; the central plains; and the northern region of marshlands, lakes, and barren hills. The Vistula (620 miles) is the chief waterway. It is almost wholly in Polish territory, and its "corridor" is of great commercial importance. Usually frozen from December to March, it averages only from 240 to 290 days annually for navigation.

Climate. The climate is transitional between the oceanic climate of Western Europe and the continental climate of Central Russia. In Galicia, however, a severe climate is experienced, for the land lies open to the north and north-east winds (Lwów, January, 24° F.; July, 66° F.). In the plains the annual rainfall ranges from 17½ in. to 23½ in.; on the southern plateaux the average is much higher.

Communications. The railways and roads of Poland are in vital need of reconstruction and development, but lack of capital stands in the way. Several first-class roads and railways were originally made for strategic rather than economic ends. Motor traffic is in its infancy, but the Polish aviation companies are progressing favourably, and an aerial service connects the chief Polish towns with the important European cities. There are about 11,000 miles of railway (State-owned). Polish Upper Silesia needs linking with the interior of Poland by rail and road. Except in the winter months, the Vistula and other rivers provide over 1,800 miles of navigable waterway. Danzig, the natural port, though a free city, is under the Central Customs Administration of Poland, and under Polish suzerainty for foreign affairs, and is the chief seaport of the Republic. Recently, Poland has begun to develop her own Baltic port, Gdynia, on Polish soil, in the "corridor" granted her just west of Danzig. It has been partially open to navigation since 1927, and will eventually be larger than Danzig.

Productions and Industries. *Agriculture.* The Poles have always been an agricultural people, and 65 per cent of the total population still derives a living from the land. About 49 per cent of the total area is arable land, and about 17 per cent is pasture land. The peasantry, though in the main backward and undeveloped, are important in the national life. Many are prosperous, and the recent expropriation of large estates has made them more prominent. The chief crops (yield in million metric tons) are: wheat (1.7), rye (5.7), barley (1.5), oats (2.8), potatoes (25.0), and sugar-beet (4.0). Much attention is given to live stock. Cattle number 7,838,000; pigs, 5,119,000; horses, 3,192,000; and sheep, 2,167,000. Dairying and poultry farming are progressing, and bee-keeping is growing in the Carpathian districts.

Forestry. Poland's forest wealth is almost incalculable. Pine woods are scattered about the centre of the country; oak, beech, and lime cover the foothills of the Carpathians; coniferous trees abound in the north and north-east; and aspen, elm, birch, and hornbeam are widely distributed. The forests are State-owned and State-controlled. In 1924, British commercial enterprise secured a ten-years' concession for the exploitation of four State forests, one of which is the primeval forest of Bialowieza (360,000 acres).

Mining. The mineral wealth is great. Upper Silesia and the highlands of the Cracow district are the richest mineral areas. Ninety per cent of the Silesian coal-field and 82 per cent of the zinc area of Upper Silesia are Polish. The annual coal production is 46,000,000 tons, and of this 15,000,000 are exported. It is estimated that there is enough coal to mine annually 50,000,000 tons for 300 years. The production of zinc is 11 per cent of the world's supply. Iron ore, of moderate quality, is abundant, and is mined chiefly in the Lysa Gora district, and near Cracow. Petroleum ranks next to coal as Poland's most important mineral product, and the richest oil-fields are at Cracow, Jaslo, Drohobycz, and Stanislawów. At several points in the oil belt ozokerite is worked. The vast rock-salt mines of Wieliczka (estimated to contain over 20,000,000 tons of salt) and Bochnia have been famous since the twelfth century.

Manufactures. In manufactures Poland is becoming increasingly self-supporting. The most important industries are textiles with Lodz, Warsaw, Kalicz, Czenstochowa, Blonie, Byelostok, and Biala as the main centres, metallurgical industries (in Poland proper and Polish Upper Silesia), chemicals, electrical engineering, spirits, starch, sugar (beet), beer, glass, tobacco, matches, agricultural machinery, timber, and leather.

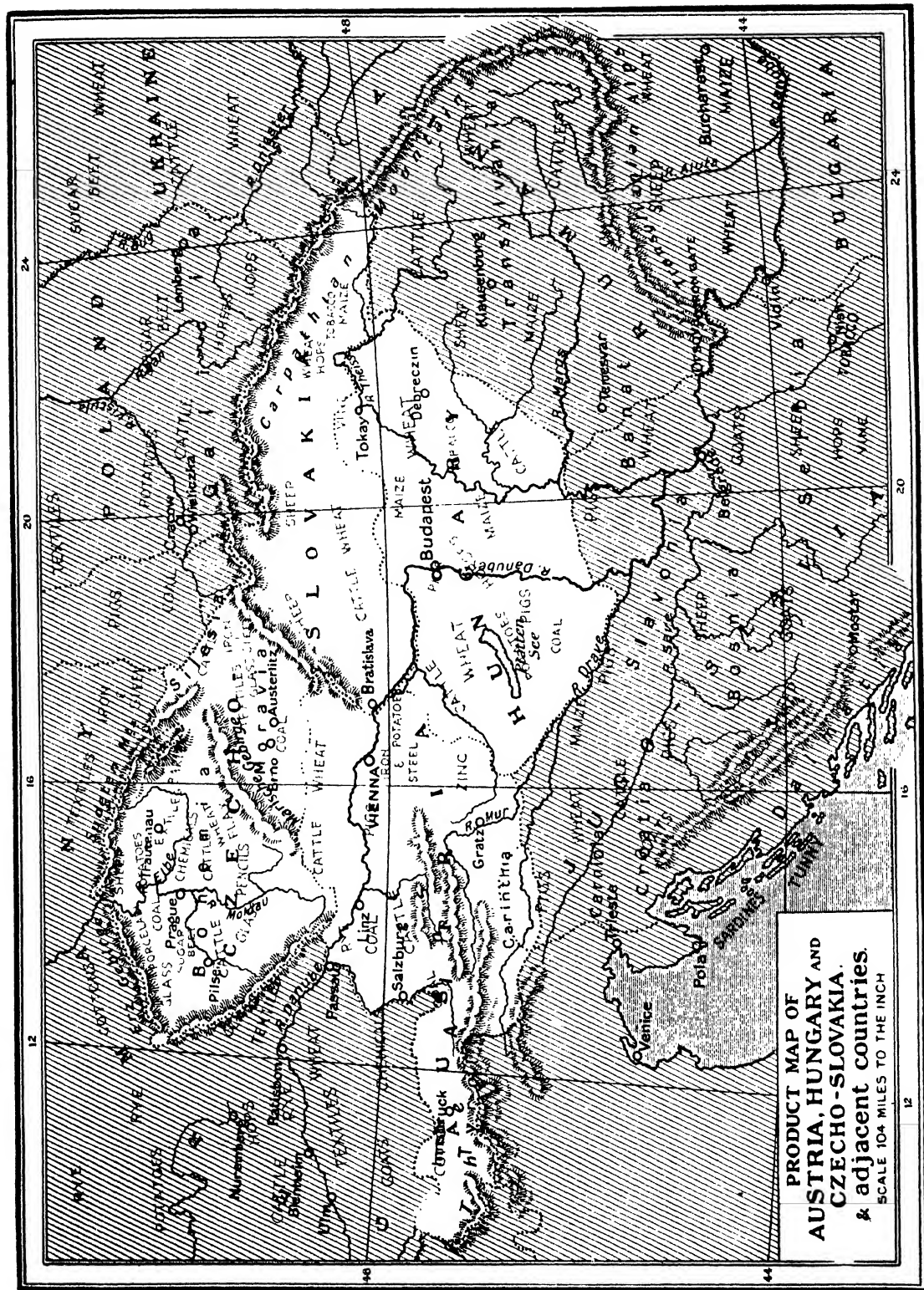
Commerce. Most trade is with Russia, Germany, France, the United Kingdom, Czechoslovakia, Austria, Scandinavia, and the Balkan countries. The chief exports are agricultural and forest products, chemicals, hardware, enamel goods, petroleum, coal, ores, and textiles; and the chief imports are raw wool, cotton, jute, woollen and cotton goods, machinery, vegetable fats and oils, fish, and colonial produce.

Trade Centres. The chief towns are: *Warsaw* (1,178,000), the commercial and political capital; *Lodz* (605,000), the Polish "Manchester"; *Lwów* (316,000), the capital of Galicia; *Poznan* (247,000), a sugar-refining and distilling centre; *Cracow* (221,000), the ancient capital.

CZECHOSLOVAKIA

Position, Area, and Population. The Republic of Czechoslovakia (54,207 square miles; 14,726,000 population; 64 per cent Czechs and Slovaks, 23 per cent Germans, 5 per cent Magyars, 4 per cent Ruthenians), established in 1918, embraces the former Austrian provinces of Bohemia, Moravia, and Silesia, together with the upper part of pre-war Hungary, known as Slovakia and Carpathian Ruthenia. Lying entirely inland, it has Austria, Hungary, and Rumania on the south, and Germany, and Poland on the north. Right of access over the Labe (Elbe) and Oder to Hamburg and Stettin has

been gained, and the Government is canalizing the Upper Labe in order to connect it with the Oder and the Danube. The country has a peculiarly elongated shape from east to west. Bohemia and Moravia form its diamond-shaped "head." Slovakia is its oval-shaped "body"; and Ruthenia is its narrow "tail." Bohemia and Moravia possess the richest mineral deposits, the best agricultural lands, and the most intellectual and enterprising people; while Slovakia and Ruthenia are backward educationally and economically. Difficulties are provided by the differences in race, language, and creed; the



open nature and inland position of the country; and the lack of an east-west railway.

Relief and Climate. Bohemia is a basin, bounded by four sections of the pre-Alpine block mountains. On the north-west the Erzgebirge (Ore Mountains) rise abruptly to over 4,000 ft., but leave a line of communication by the deep-cut gateway of the Labe. The north-east border runs along the summits of the Giant Mountains, the crest of the Sudetic range attaining in the Schneekoppe an elevation of 5,300 ft.; thence there is a dip towards the Moravian river system, beyond which the Beskid heights rise up to join those of the Tatra and the Carpathians. The parallel ridges of the Bohemian Forest on the south-western side reach nearly 5,000 ft. on the south. Bohemia is hilly in the south (mean elevation, 1,500 ft.), and level in the north (600 ft. to 900 ft.). The chief rivers are the Vltava (Moldau) and the Labe (Elbe). Moravia and Silesia occupy the south-east side of the Boian plateau, and stretch over the lowlands bordering the western chains of the young Carpathians. The south is drained by the Upper Morava to the Danube, the north by the headwaters of the Oder to the Baltic Sea. The water-parting between the two rivers is low in the Carpathian forelands, and forms the deep Moravian Gap, an important route-way. On the east are the Carpathian hill-country, the High Tatra, and part of the Alföld. Of the rivers, the Tisza flows to the Danube, and the Propád to the Baltic Sea.

The climate is transitional between the oceanic type of Western Europe and the continental type of Russia. Prague (Prahá) has a mean annual temperature of 48° F., and a range between 30° F. and 68° F. The rainfall is heaviest in the summer months, and varies between 20 in. and 30 in. in the basin, and between 40 in. and 70 in. in the mountain borders.

Communications. There are 8,700 miles of railway. The main lines were built before the War to run from north to south, converging on Vienna and Budapest, and now have to serve a traffic from east to west. The outlets for trade are by the Elbe and its valley, by the Danube, and through the Moravian Gate. From its junction with the Vltava the Elbe is navigable to Hamburg, and the Vltava is navigable as far as Prahá. Slovakia has the Danube as its great waterway, and Bratislava as its river port. Its trade passes up the river to north-western Europe and down the river to the Black Sea ports. Less traffic goes *via* the Oder to Stettin.

Production and Industries. Agriculture is the most important industry, employing 44 per cent of the population. Huge estates have been expropriated, and the country has become a land of peasant farmers, cultivating their small farms very intensively. In the Labe, Eger, and Vltava valleys, sugar-beet is grown on a scale that puts the country third in

world production. Rye and oats, and, to a less extent, wheat, barley, and maize are produced, but the output does not meet local demands. Potatoes are used largely for the distillation of alcohol; and hops with local barley support the breweries of Plzen and Prahá. Stock-raising is an important industry, especially in Moravia, Slovakia, and Ruthenia.

Forestry. Forests occupy 33 per cent of the country, and there is a large export of sawn timber, pit props, sleepers, paper, and cellulose.

Mining. About 80 per cent of the mines and industrial enterprises of the former Austro-Hungarian Empire are located in Czechoslovakia, and in mineral wealth the country ranks among the first in Europe, containing practically every useful mineral. Coal is very abundant. The most important beds are those at Ostrava, and those near Kladno and Plzen. Lignite is worked near Teplitz. The annual production is 16,000,000 tons of true coal, and 20,000,000 tons of lignite. Iron is obtained in Bohemia and Slovakia (2,000,000 tons annually). There are naphtha wells near Gbely (heavy oils), and at Ratiskovice and Bohuslavice (light oils), and at Joachimsthal, in north-west Bohemia, large radium-pitch-blende mines. Silver is extracted at Příbram, graphite at Budweis, and fine glass sand in the sandstone areas, and the richest opal mines in Europe are at Kosič. Excellent kaolin is found in the Karlovy Vary district.

Manufactures. Manufactures are in an advanced stage, especially textiles, glass, porcelain, beer, and fancy goods, and approximately 70 per cent of the products are exported. Glass manufactures are centred at Prahá, Teplitz, Olmütz (Olomouc), and Aussig (Ústí n. L.), and porcelain at Karlsbad (Karlovy Vary). Textiles are important at Brno (Brünn), Ruzomberok, and Prahá, and hardware is manufactured at Kladno and Pisek. Chemical industries are important at Prahá and Brno, and machinery is manufactured in the leading cities. Hydro-electric schemes are making headway.

Commerce. Most trade is with Austria, Hungary, the Balkan countries, Jugoslavia, Poland, Russia, Germany, France, Great Britain, and the United States. The chief exports are beet-sugar, coal, timber, wool, and woollen goods, glass and glassware, wood pulp, matches, cotton goods, porcelain, steel and metal goods, transport material, leather and leather goods, hides, and clothing; and the chief imports are grain, foodstuffs, iron and steel goods, high-grade textiles, raw cotton, raw wool, and oils.

Trade Centres. The chief towns are *Prague* (Prahá) (848,000), the capital and chief route centre; *Brno* (Brünn) (264,000), the capital of Moravia; *Plzen* (Pilsen) (114,000), the second town of Bohemia; *Bratislava* (Pressburg) (124,000), the chief Danube port; *Kosič* (70,000), and *Olomouc* (60,000).

SPAIN AND PORTUGAL

(THE IBERIAN PENINSULA)

69

THE REPUBLIC OF SPAIN

Position, Area, and Population. Spain is a country which has fallen from a very high position. In the sixteenth century it was commercially and politically one of the greatest Powers in Europe, and possessed vast colonies; now it is of minor importance in Europe, and has lost most of its colonies. With Portugal, Spain forms the Iberian Peninsula, which is the western extremity of the European mainland. Continental Spain has an area of 190,950 square miles, but including the Balearic and Canary Islands, and the possessions on the north and west coasts of Africa, the total area is nearly 195,000 square miles. The population is only about 22,940,000, and shows no signs of increasing to any very appreciable extent. Spain is African in physique and influence. Though possessing an excellent geographical position, its shape, configuration, relief, and climate are against its commercial development; and throughout history these have combined to produce a people utterly rebellious against, or indifferent to, the acquirement of industrial wealth. Apart from the energetic Catalonians, the Spaniards have a reputation for indolence. Communications and education are both backward; racial distinctions are sharp; and national patriotism in contrast with local is difficult to achieve. There is room, therefore, to doubt whether Spain can continue to exist as a single country.

Coast Line. The proportion of coast (712 miles, Mediterranean; 605 miles, Atlantic) to surface is very small, and the coast is adverse to commerce and climate, uninviting, and lacking in good harbours. The long, straight northern coast, bordered by the young folded Cantabrians, running parallel to the foundered shore, is steep and rocky everywhere; and, though there are many small indentations between the spurs of the range, the ocean and river currents quickly silt up the harbours of Bilbao, Santander, and Gijón, necessitating constant dredging. In Galicia, the rias make excellent harbours, but they are not great ports because of the exposed and stormy nature of the coast, and the distance from coal- and iron-fields. Sand-dunes line the coast from the Portuguese border to the almost unbroken marsh (the Marismas) of the Guadalquivir estuary; but where the terminal ridges of the Sierra Nevada are truncated on the verge of the ocean, magnificent harbours, such as those of Cadiz and Gibraltar, are found. Eastward, the coast becomes steep and regular, though Cartagena, Malaga, Alicante, Valencia, and Barcelona have been converted into useful ports. Much of this coast, however, is sand-dune, with complete or incomplete storm beaches. Generally, the Spanish coast has been a barrier to access rather than a base for outlet, and minimum coast and maximum plateau discount the advantageous position between ocean and sea.

Relief. More than half of Spain is composed of tablelands and mountains, the average height of the whole country being about 2,300 ft., and there is an area as large as Ireland that is over 3,000 ft. The greater part of the country is occupied by the plateau, known as the Meseta, a mass of old hard rock, largely granitic, which has been worn down to a peneplain, and then uplifted. In its northern half

it has an average elevation of about 2,700 ft.; in its southern about 2,000 ft. On its surface lie saucer-like hollows, great expanses of very recent deposits. These saucers (the Tagus, Guadiana, Upper Ebro, and Upper Douro basins) were in recent geological times great lakes, which were gradually drained and dried up. In the north, the Meseta is flanked by the young folds of the Pyrenees and Cantabrian Mountains, and in the south by folded ranges, closely allied to the Atlas Mountains in structure, and variously named, though often called the Sierra Nevada, a name properly applicable only to one small and high ridge south of Granada, containing the peaks of Mulahacen (11,430 ft.) and Valeta (11,400 ft.), the highest in Iberia. "Sierras," or saw-toothed ridges, roughly parallel to each other and running east and west, separate the lofty plains of the Meseta. In the north, the Douro and Upper Ebro, draining the land in opposite directions, are bounded on the south by the Sierras da Estralla, de Gata, de Grados, and de Guadarrama, rising to 4,000 ft., or 5,000 ft. South of these mountains the Tagus basin is separated from the Guadiana basin by the Sierras de Guadeloupe and de Toledo; and the southern edge of the plateau, with peaks of over 7,000 ft., forms the so-called Sierra Morena, a steep escarpment falling to the River Guadalquivir. The whole plateau is somewhat tilted towards the west, so that all the large rivers, except the Ebro, flow westward and rise near the east coast. Deep gorges and rapids in their courses and varying volumes make the rivers obstacles to communication, and of comparatively little use for irrigation. The Pyrenees, with their western prolongation, the Cantabrian Mountains, extend for about 500 miles, and form a barrier between Iberia and the rest of Europe. They consist of a core of old rock, flanked to the north and south by slopes of young limestones and sands. On the French side they rise sharply; on the Spanish side more gradually.

Climate and Vegetation. Four climatic regions may be distinguished: the North and North-West; the Meseta; the Andalusian Plain; and the Mediterranean lands. The first region has summers neither hot (July, 70° F.) nor very dry, and winters (January, 45° F.) mild and moist; rain occurs at all seasons, and averages about 30 in. to 40 in. annually. The climate of the plateau is characterized by its low rainfall and great extremes of temperature, both daily and seasonal (Madrid, January, 39° F.; July, 76° F.). High mountains prevent rainy winds from reaching the centre, and the average annual rainfall is well below 20 in. Andalusia enjoys a heavier rainfall (30 in. and over), and is less subject to extremes. The western margins of the Mediterranean and the Ebro valley possess the typical "Mediterranean" climate of hot, dry summers and mild wet winters (mean temperature 61° F. to 64° F.; mean rainfall, 14 in. to 23 in.).

The vegetation is remarkable in its diversity. In the north are found most of the varieties of northern and temperate Europe; while, in the south, at Elche, a forest of date palms poaches upon African prerogatives. Barely half the country has a predominant Mediterranean flora, characterized by

evergreen shrubs. From the greater part of the Meseta, trees are entirely absent, and the vegetation, though otherwise of Mediterranean type, is peculiarly specialized, many of the species not being found elsewhere. The north-west grows wheat and rye; the south-east is the great esparto-growing area; and the intermediate region is typically steppe, largely saltish, and producing the stimulating aromatic herbage which developed the famous cattle of the Guadarrama and the merino sheep of the Toledo highlands, now greatly degenerated. On the eastern lowlands, under irrigation, fertile *huertas* (gardens) produce every Mediterranean fruit and grain.

Land and Water Routes. The rivers flowing to the west, with the exception of the Guadalquivir, are of small use for trade, and in the Mediterranean section the Ebro, which allows sea-going vessels to proceed to Tortosa, is the only one of importance. The roads are extremely poor, and no less than 4,000 villages are said to be without any roads at all. Railways (10,000 miles) suffer from lack of directness, single tracks with heavy gradients, and difference of gauge on main and secondary lines. Plans have been made, however, for vast improvements, and motor transport is increasing. The chief railway lines are the Northern Railway (Irun-Valladolid-Madrid), the Madrid and Portugal (Madrid-Talavera-Valencia-d'Alcantara-Lisbon), the Madrid-Alcalzar-Murcia-Cartagena, the Madrid-Barcelona, and the Madrid-Alcalzar-Cordova-Malaga-Gibraltar-Seville-Cadiz.

Productions and Industries. Agriculture. The Spaniards are largely dependent on agriculture, but their farming does not reach a high standard. The chief crops grown are wheat, barley, oats, and rye. In Old Castile there are great irrigation works, and excellent wheat is produced. On the terraced hill-sides and coastal plains of Valencia, Murcia, and Granada, and in fertile Andalusia, excellent oranges, lemons, grapes, figs, olives, almonds, nuts, and other fruits are grown. Maize and tobacco flourish on the alluvial plains. Crops specially characteristic of Spanish agriculture are chick-peas, garlic, and onions. Esparto grass is a valuable product of the eastern coastal plains, and flax and hemp are grown in the north. Irrigation is a necessity in a great part of Spain, and the Spaniards were provided with excellent examples of irrigation by the Moors, but they do not, as yet, make the best use of water. Locusts are a great trouble. In the south, especially in the regions of Granada and Malaga, the production of sugar, both cane and beet, is being continually increased. The cultivation of cotton has been commenced under Government protection. Britain annually obtains from Spain more than 300,000 tons of oranges and lemons, about a third as much of fresh grapes, some 8,000 tons of melons, nearly as many tons of raisins, and huge quantities of onions, almonds, tomatoes, olives, and other fruits, along with derivatives, such as olive oil. The cultivation of cork was formerly very important, but the recent introduction of the cork disk with a metal cover instead of the ordinary cork, has hit the bottle industry very hard. Full-bodied wines of Spain are well known. Some 3,300,000 acres are under vines, and the annual production of wine is about 507,000,000 gallons. The best-known wines are the sherry of Andalusia, the red "Rioja," the

"black" of Alicante, the Malaga, and "Tarragona port."

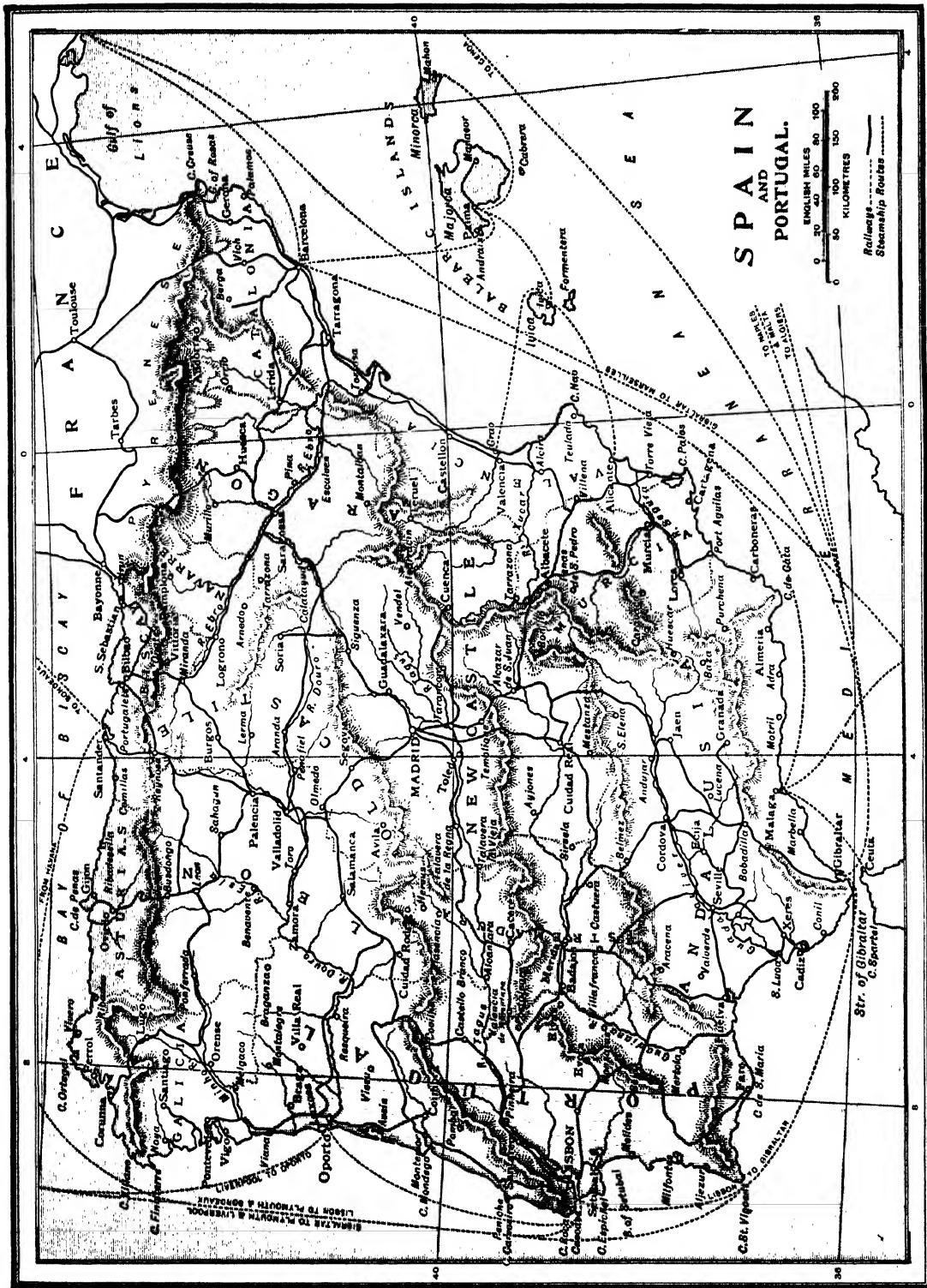
Almost one-quarter of Spain is used only for pasturage. The merino sheep is the chief animal, and Spain once had a reputation for excellent wool. Cattle and goats (4,000,000) roam over the plateau, and pigs feed in the oak forests of the south-west. Horses, bulls, mules, and asses are bred in Andalusia. The great stretches of dry pasture on the tableland are useful only for sheep farming (21,000,000 sheep), an occupation which was formerly much more prosperous than now. In winter, the flocks are driven down to the warm and low-lying districts of the south, returning to the highlands in spring.

Forestry. Spain is not well forested. Lack of foresight has resulted in Spain being more treeless than it should be. The slopes of the Pyrenees are clothed with forests of oak and beech, and the Highlands of Galicia and the Cantabrian Mountains are covered with deciduous forests. The cork oak grows in the south-west, while the Mediterranean lands have the characteristic olive, chestnut, and mulberry trees.

Fishing. Fishing is a considerable industry most extensively conducted from the Galician shores. Sardines, anchovies, tunnies, and cod are the chief catches. At Vigo and Corunna, the catching, packing, and exportation of sardines and tunny are important, and fresh fish is sent to Madrid.

Mining. Spain is rich in minerals. Iron is abundant in the provinces of Vizcaya, Santander, Oviedo, Huelva, Almeria, Navarra, and Seville (annual production, 2,500,000 tons). The principal coal-fields are those situated in Asturias, in the north-west, stretching from the coast into the province of Leon, the Peñarroya coal-field in Central Spain, and the Ebro coal-fields. Of these, the Asturian fields, with Oviedo as the centre, are undoubtedly the most important as being producers of steam coal. The other fields produce either lignite or inferior coal, with the exception of Cordova, where the principal output is anthracite. Copper is chiefly produced from the famous Rio Tinto mines, near Huelva. These mines are now in British hands, and supply over 2,000,000 tons a year, or about a quarter of the world's supply. Lead is found in Murcia, Almeria, and Jaen; manganese at Huelva and Seville; zinc at various places adjacent to the northern coast; phosphorus at Caceres and Huelva; cobalt in Oviedo; sulphur in Murcia and Almeria; platinum near Ronda; mercury at Almaden; and silver at Guadalajara. Bay salt is largely produced on the southern coasts, and rock salt is plentiful in Guadalajara.

Manufactures. Spain to-day manufactures something of nearly everything. The Great War led to the development of many existing industries and the establishment of new ones. Spanish engineers recognize the paramount importance of electric energy, and 500,000 h.p. are utilized out of a potential 4,000,000 h.p. The chief manufacturing centres have been determined more by ease of communication than by local supplies of coal and iron, and in some localities have depended on the energy and skill of the people. Barcelona takes the lead in manufactures, and textiles are important there. Iron goods are made at Bilbao and San Sebastian; cloth is manufactured at Palencia, pottery at La



Granja, and tobacco at Seville. Silk-spinning and weaving are carried on in Murcia and Valencia, where the silkworm is chiefly reared. Xeres is noted for sherry, and the Ebro basin for "Tarragona port." Many of the towns of the Mediterranean coast have important industries in connection with the preparation of wine, cork, and fruits.

Commerce. The chief imports are machinery, iron and steel goods, chemicals, textiles, raw cotton, spirits, fish, flour, timber, railway material, hides, motor-cars, china, sugar, and fancy goods. The exports are an index of the natural resources, being wine from Cadiz and Tarragona; metals and minerals from Bilbao, Santander, Gijon, Huelva, and Cadiz; southern fruits from the southern and eastern ports; and wheat, maize, flour, and esparto grass from Valencia, Alicante, and Cartagena. The United Kingdom, France, the United States, Germany, Belgium, Portugal, Italy, Holland, Switzerland, and Czechoslovakia are the chief countries with which Spain trades.

Trade Centres. The chief towns are *Madrid* (834,000), the capital; *Barcelona* (783,000), the chief manufacturing centre; *Valencia* (275,000), an important commercial centre; *Seville* (219,000), a southern river port; *Malaga* (188,000), a Mediterranean port; *Saragossa* (156,000), an important route centre; *Murcia* (159,000), a fruit-growing centre; *Bilbao* (154,000), the largest Basque town; *Granada* (110,000), "the City of the Moor"; *Cartagena* (97,000), the principal arsenal and naval base; and *Santander*, *Córdoba*, *Valladolid*, *Cadiz*, *San Sebastian*, *Toledo*, *Salamanca*, *Alicante*, *Corunna*, *Leon*, *Oviedo*, *Ciudad Real*, *Tarragona*, *Lerida*, *Badajoz*, *Burgos*, and *Vigo*.

The Balearic Islands (1,935 square miles; 360,000 population) comprise two groups of Mediterranean islands, of which the largest are Majorca, Minorca, and Iviza. The islands are the summits of a submarine ridge of tertiary origin, and form a province

of Spain. Wine, olive oil, cereals, fresh vegetables, figs, oranges, lemons, almonds, apricots, persimmons, carobs, rice, honey, butter, cheese, and marble are the chief economic products. *Palma* (80,000), the capital, on Majorca Island, trades chiefly in fruits, vegetables, and woollen cloth. *Port Mahon* (20,000), the capital of Minorca, has one of the best harbours in the Mediterranean, and is strongly fortified. *Iviza* (7,000), the capital of Iviza, exports fruit, salt, and lead.

The Canary Islands (2,807 square miles; 480,000 population), lying off the north-west coast of Africa, form a province of Spain, and consist of seven inhabited and six uninhabited islands. Grand Canary and Teneriffe are the best watered and most fertile of the group. The climate is "Mediterranean," and the islands are a popular health resort in winter and spring. Bananas, figs, pomegranates, grapes, oranges, dates, cereals, tomatoes, potatoes, coffee, sugar, wine, and cochineal are the chief economic products.

Santa Cruz, the capital of Teneriffe and the Canary Islands, is an important seaport, coaling station, and commercial centre. *Las Palmas*, the largest town of the Canaries and the capital of Grand Canary, possesses only an open roadstead, but is connected with its port, *La Luz*, which has an excellent harbour.

Foreign Possessions. The once vast colonial empire of Spain is now confined to a few undeveloped holdings in Africa (128,606 square miles; 785,000 population). These holdings are Ceuta, Rio Muni, Rio de Oro and Adrar, Melilla, Peñon de Valez, the Chaffarenas, Ifni, Spanish Morocco, Fernando Po, Annobon Island, and the Corisco Islands.

Mails and Time. Mails are dispatched from Great Britain to Spain twice a day. The time of transit to Madrid, which is 1,150 miles distant from London, is from 45 to 50 hours.

Greenwich time is used throughout the country.

PORTUGAL

Position, Area, and Population. The Republic of Portugal (total area, including the Azores and the Madeira Islands, 35,490 square miles; 6,655,000 population), the most westerly European State, fills a narrow strip in the west of Iberia, and its outlook is towards the broad Atlantic and America. Its coast line (nearly 465 miles) is mostly low, but develops rocks and heights in the lower part of the middle section, and beyond Cascaes is a "mouth of hell," where sea and surf lash and roar unceasingly. Near Cape da Roca the coast forms an ample bay, where the Tagus has its outlet, and contains the fine harbour of Lisbon.

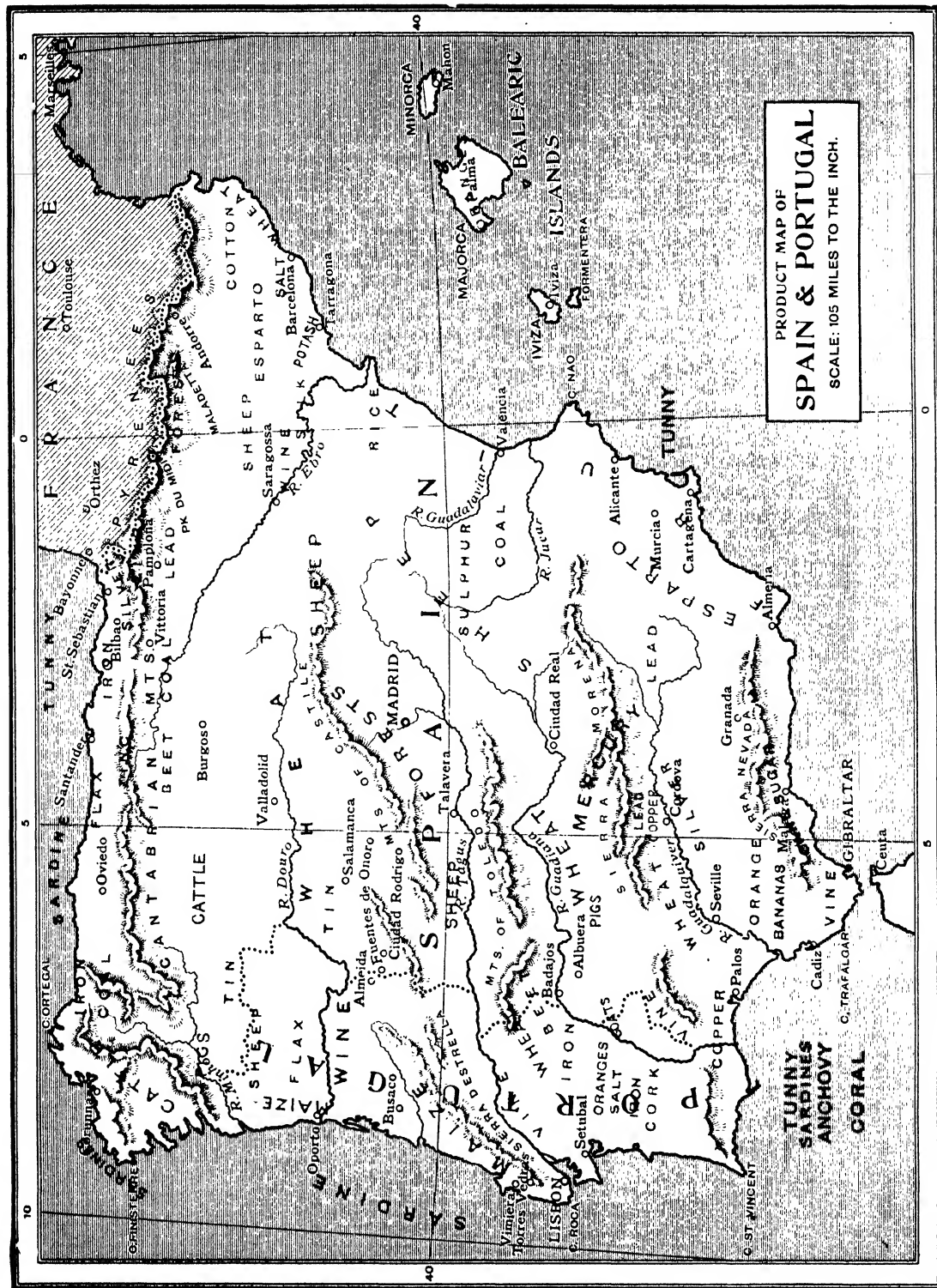
Relief and Climate. The chief natural divisions are the western portion of the Meseta; the plains of Alemtejo and Estremadura; the lower valleys of the Minho, Douro, Tagus, and Guadiana; the narrow coastal plain from the Minho almost to Cape da Roca; and the mountains of Algarve. The sierras of Spain are continued in the Sierra da Estrella (6,532 ft.) and the Sierra de Monchique. Both the Douro and the Tagus are navigable for small steamers to the frontier.

In the north the climate is cold and damp; in the Mondego district temperate and damp; and in the south almost tropical and Saharan. North of the

Douro the mean annual temperature is 50° F.; at Coimbra nearly 62° F.; and in the Guadiana Valley over 64° F. Oporto has a mean annual temperature of 59° F.; the Sierra da Estrella 45° F.; and Lisbon 61° F. Much heavier rains fall in the north than in the south. Oporto sometimes receives 50 in. of rain in the year, Coimbra 35 in., and the south 18 in.

Land and Water Routes. Both roads and railways are in considerable need of improvement. There are about 2,000 miles of railway, mostly broad gauge. The main lines radiate from Lisbon northward through Coimbra and Oporto to Valença do Minho, and south-east to Faro. Branch lines run along the Tagus and Douro valleys, and all the important towns are connected. Traffic is carried on mainly by the railways, though water transport on the Douro and the Tagus is of fair extent.

Productions and Industries. *Agriculture* occupies 60 per cent of the population. The country is very fertile, and given improvements in transport and irrigation, and scientific farming methods, production could be doubled. The chief cereals are maize, millet, wheat, rye, and rice. Rye is grown mainly in the mountainous tracts, rice in the lowlands, maize in the greater part of the country, millet on light soils, and wheat in the Alemtejo region. Wine



is made all over the country, generally of comparatively heavy body. Some 500,000 acres are devoted to the vine. Near the mouth of the Douro gorge, for a length of 30 miles and a width of 5 to 10, the steep cliffs are terraced in tiers and covered with vines. This sheltered spot (100,000 acres) is one of the richest wine-producing regions of the world, and its speciality is the port wine, which is stored at Villa Nova de Gaia, on the banks of the Douro by Oporto. About 5,000,000 to 6,000,000 gallons of port wine are annually exported to the United Kingdom. Portugal is the fourth olive-producing country (12,000,000 gallons of olive oil annually). Fruits (figs, carob, oranges, lemons, citrons, raisins, apples, almonds, dates, and nuts) of first quality are grown. Onions, tomatoes, potatoes, beans, flax, and hemp are important. Over one-quarter of the country is given up to pasture and fallow. Live stock number 6,000,000. Sheep total 3,850,000; while the remainder in order of number are goats, pigs, cattle, donkeys, horses, and mules. Over 800,000 acres are given to cork trees, and Portugal ranks second in the world production of cork (50,000 to 70,000 tons annually). Salmon and lamprey are caught in the rivers, sardines along the western coast, and tunnies along the Algarve coast.

Mining. Much mineral wealth exists, but is little exploited. Coal is worked in Cape Mondego and near Coimbra, and in the north there is believed to be an abundance of good coal. Copper is mined in Alemtejo, iron ore in Moncorvo, and the wolfram deposits are among the most important in the world. Salt occurs in rock form and crystallized, and the "bay" salt of the southern coast is of fine quality.

Manufactures. The principal manufacture is the production of textiles at Lisbon, Braga, and Bra-

ganza. Between £5,000,000 and £6,000,000 of English capital is invested in the port wine industry.

Commerce. Most trade is carried on with the United Kingdom, Germany, France, the United States, Brazil, Angola, Spain, Italy, and Belgium. Great Britain plays a very important part in Portuguese overseas trade, supplying a large proportion of the imports and doing much of the carrying trade. In addition, the principal Portuguese industries are largely run and financed by British firms. The chief exports are wine (predominant), sardines, pit props, cork, textiles (to Portuguese colonies), fruit, copper pyrites, salt, wolfram, cattle, and olive oil; and the chief imports are wheat, maize, dried cod, coal, raw cotton, petroleum, textiles, iron and steel goods, machinery, wool, sugar, and colonial produce.

Trade Centres. The chief towns are *Lisbon* (530,000), the capital and chief port; *Oporto* (216,000), the second port and rival of Lisbon; *Setúbal* (38,000), the third port; *Braga* (23,000), *Coimbra* (21,000), and *Evora* (16,000).

Colonial Possessions. The Portuguese possess important colonies, totalling over 800,000 square miles, with a population of about 10,000,000. They include the Cape Verde Archipelago, São Thomé, Principe, Portuguese Guinea, Portuguese West Africa (Angola and Kabinda), Portuguese East Africa, Portuguese India (Goa, Damão, and Diu), Portuguese Timor, and Macao.

Mails and Time. Mails are dispatched once a day from Great Britain to Portugal. The time of transit to Lisbon, which is 1,110 miles distant from London, is 50 hours. To Oporto the time of transit is two and a half days.

Greenwich time is in use in the country.

Position, Area, and Population. The Kingdom of Italy, the central peninsula of Southern Europe, almost joins the snowy Alps to the arid Sahara. Since the Great War she has acquired the Trentino, Gorizia, Gradisca, Alto Adige, Carniola, Trieste, Istria, and Fiume, thus attaining her natural frontiers; and now comprises a total area of 119,710 square miles with a population of 41,500,000. Ethnically, the Italians are remarkably mixed, but they present a unity of speech, and have behind them the traditions of a system of government that once dominated the world. In the north, east, and west of the Euganean Hills the Lombards of the plain are rougher in manner and tongue than the Venetians. In the peninsula the Tuscan is less light-hearted and more industrious than the Neapolitan. The northern people, often fair, are more energetic than the southern people, who are short and dark.

Relief. North Italy is occupied by the Lombardo-Venetian lowland, a long, narrow trough formed by subsidence between the Alps and Apennines, and constituting the richest and most densely populated part of Italy. Its great river, the Po, crosses it from west to east in a direct course of some 220 miles to the Adriatic. On the north, west, and east tower the Alps of Piedmont, Lombardy, and Venetia, trenched by numerous transverse valleys, the results of river erosion, by which roads are carried through the bordering mountains up to the famous passes—the Mt. Cenis, Simplon, St. Gotthard, Splügen, Maloja, and Brenner. Among the foothills of the Alps lie great lakes of entrancing beauty—Orta, Maggiore, Lugano, Varese, Como, Lecco, Iseo, Idro, and Garda—important as pleasure resorts and as the great reservoirs of the rivers.

South of the continental plain stretches the long peninsular portion of Italy, shaped like a boot, with its heel in Apulia, its toe in Calabria, and its instep formed by Basilicata and the Gulf of Taranto. The long range of the young folded Apennines, which governs its physical character, threads it from the Altare Pass to Cape Spartivento, presenting a steep face to the Adriatic in the northern half and to the Tyrrhenian Sea in the southern half. On the western side of the northern Apennine curve lie the lowlands of Tuscany and Latium, their coast lines bordered by the marshlands of the Maremma and the Roman Campagna, to which the Arno and the Tiber add alluvial deposits. In the Abruzzi the Apennines reach their greatest height in Monte Corno (Gran Sasso d'Italia), 9,583 ft. The unstable condition of the earth's crust in the regions south of Parma is indicated by the spasmodic activities of Etna, Vesuvius, Volcano, and Stromboli.

Sicily, geologically a continuation of the Apennine backbone, is separated from the toe of Italy by only 2 miles of water, and Mount Etna (10,865 ft.) bears witness to the volcanic disturbances which caused the Messina rift. The islands of Elba, the Tuscan Archipelago, and Sardinia are, like Sicily, remnants of an ancient coastal block. Sardinia consists of two highland masses of old, hard rock, mainly granite, divided by a lowland, treeless and malarial, extending north and south from Sassari to Cagliari. It is an island of dwarfs—man and beast.

Climate and Vegetation. In climate the great plain is altogether continental. The whole region has a January average temperature of 32° F. to

36° F., and a large part of it has from 76° F. to 79° F. in July. Rain falls at all seasons (annual fall 28 in. to 48 in.), but is more frequent in late autumn. Peninsular southern Italy has the "Mediterranean" climate of moderately wet winters with prevailing westerly winds, and very dry summers caused by the trade winds. The rainfall of the centre averages about 32 in., and of the south not much more than 27 in. Florence has a mean annual temperature of 59.4° F., Rome, 60° F., and Naples, 62.2° F. For most of the year the air is clear and dry, and the skies are of an enchanting blue. Occasionally, however, fogs rise from the marshes; the piercingly cold *tramontana* blows from the mountain tops; the gusty *bora* beats up the shallow Adriatic waters; and the *sirocco* scourges the south. Malaria is very common in Sicily, Sardinia, the Maremma, the Roman Campagna, Basilicata, Calabria, Apulia, and the Po delta.

Italy suffers from forest exhaustion, partly due to careless past deforestation. The Mediterranean belt of the peninsula is characterized by the evergreen oak and pine, the Aleppo pine, the cypress, and low evergreen and often thorny, aromatic shrubs. Severe winters exclude the olive from the Plain of Lombardy. Elsewhere, however, it flourishes, even in the sheltered Alpine valleys. In Lombardy and in the mountains the flora of Central Europe prevails. Sicily has palms, and forests of chestnut and beech; the Apennine slopes in parts bear oak and beech; the mulberry is characteristic of the Lombardy Plain; and the Alps have the chestnut on their lower slopes, and birch and pine on their higher slopes. Rich grasslands are found in the Alpine and Apennine meadows and in the irrigated plains, but elsewhere they vary from moderately good to poor.

Land and Water Communications. As no part of the peninsular portion of Italy is more than about 60 miles distant from the sea, and as the Apennines form the great backbone of the country, the rivers are little used for transport purposes; even the Po, although navigable as far as Turin, is not an important waterway. There are a few good roads and many of a primitive character. The railways (10,400 miles) are largely State-owned. From France, railways enter Italy by the coast along the Riviera from Marseilles to Genoa, Pisa, Rome, and Naples; and through the Mont Cenis Tunnel, beneath the Col de Fréjus, and down the Dora Riparia valley through Susa to Turin, whence the line passes either north of the Po to Milan (the chief railway focus), Verona and Venice, or south by Alessandria and the Aemilian Way, or over the Giovi Pass to Genoa. From Switzerland the chief railway routes are by the Upper Rhone valley, Simplon Tunnel, and the Toce valley to Lago Maggiore and Milan, and by the St. Gotthard Tunnel, the Val Leventina, and Lake Como to Milan. From Milan the railway crosses to Piacenza, follows the Aemilian Way to Parma, Modena, and Bologna, and continues along the Adriatic coast through Ancona to Brindisi. A line crosses the Apennines to Genoa and Sarzana, and by the Reno valley to Pistoja and Florence, thence by the Tiber valley to Rome. From Austria and the east there are three routes—the Brenner, by the Adige to Verona, thence to Vicenza, Padua, and Venice, or southwards by Mantua across the Po to Modena and Bologna; the Semmering, by Villach, Pontafel-Pontabba and Udine; and the

route from the Save by Laibach and Trieste to Udine, thence to Venice and Verona. Ferry boats carry the trains across the straits from Reggio to Messina.

Production and Industries. *Agriculture.* Rich soil, cloudless sunshine, and abundant water (rain and irrigation) continue to make agriculture the most important industry (30 per cent of the population). Farming, however, suffers from backward methods, malarial riverine lands, drought in the peninsula, hailstones in the north, and past misrule. Development is greatest in the northern plain, where there are few large estates; in the south, methods and implements are often primitive, and there are many large estates. The Italian Government is now, however, steadily placing agriculture on a surer basis. The chief crops are the vine (39 million acres), wheat (12), maize (3.6), oats (1.24), beans (1.2), barley (.6), rice (.31), rye (.32), potatoes (.87), sugar beet (.23), and olives (.2). The live stock includes 11.8 sheep, 7.1 cattle, 3.1 goats, 2.75 pigs, 1 horse, 1 ass, .5 mules (figures in millions). Wheat, the staple diet, is grown for macaroni in Apulia and round Parma, and for the straw-plaiting industry in Tuscany and the Piave basin. Maize is widely spread, and supplies the stodgy *polenta*. The rice of Lombardy and Piedmont is famous for its quality, but good rice is grown also round Ravenna and Salerno. The vine is cultivated practically throughout the whole country. Abundance of cheap labour, large percentage of bright sunlight, numerous cool equable cellars, and local supplies of sulphur for treating the vines favour the wine industry, and Italy comes second to France in production. The chief wines are the harsh Barolo, Asti, Passella, and Valtellina of the north, and the delicate Tuscan Chianti, Sicilian Marsala, Neapolitan Capri, Marino, Lachrymae Christi, and Posillipo of the south. Italy is the first country in the world for the quantity of olive oil produced, and rivals France in quality. The best oil comes from Lucca, Florence, Naples, and Apulia. Figs, almonds, and nuts are important southern products; and oranges, lemons, and citrons thrive in Sicily, Calabria, and Sardinia. In silk culture, Italy holds the first place in Europe and the third place in the world for total production. The industry flourishes most extensively in Lombardy, Piedmont, and Venetia. Local flax supports linen mills at Bologna and Ravenna, and hemp feeds the cordage works at Cremona, Treviso, and Mantua. Excellent cotton and tobacco are grown on the hot Calabrian and Sicilian coasts. The natural and irrigated meadows of Emilia and Lombardy are devoted to dairy cattle, and, hence, the production of Gorgonzola and Parmesan cheese. Sheep are reared chiefly on the Alpine and Apennine slopes. Poultry farming is important in the north, and chestnut forests support large numbers of swine.

Fishing. Over 100,000 people gain a poor livelihood from the coastal and sea fisheries. The tunny is caught west of Sardinia and in the Tyrrhenian Sea, and the sardine in the Gulf of Venice. Oysters are reared in the Gulf of Taranto; and corals and sponges are collected between Sicily and Sardinia.

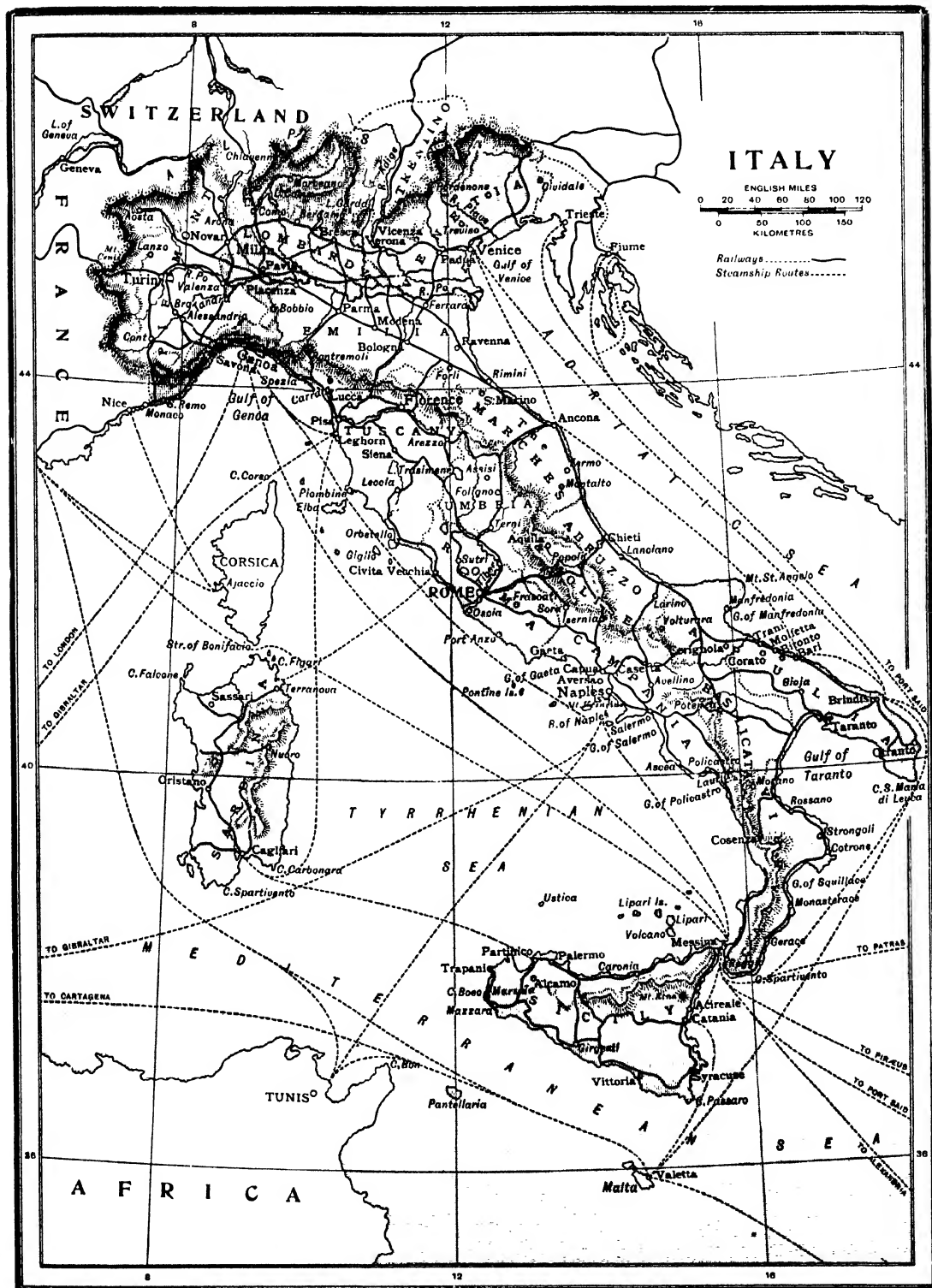
Mining. There is relatively little mineral wealth to exploit. A little iron, zinc, lead, copper, quicksilver, lignite, and asphalt are found and exploited to the full. Sulphur mining is a considerable industry

in Sicily (Girgenti and Catania), and borax in the Volterranean district of Tuscany. Coal, unfortunately, is practically non-existent, only deposits of lignite occurring near the edge of the old rock in Tuscany, especially in Arezzo, Pisa, and Grosseto. Salt is obtained by evaporating sea-water in the south, and rock-salt is found in Sicily (Caltanissetta). The finest marbles are quarried at Carrara, Massa, and Brescia. Metallic wealth is represented by the iron, lead, copper, and zinc of Sardinia (especially on the Iglesias scarp); the tin and mercury of Monte Amiata, and Monte Argentario; and the iron ore of Tuscany, Lombardy, Elba, and the Abruzzi, which supplies 40 per cent of the needs of the steel industry.

Manufactures. Relatively poor agriculturally and largely destitute of mineral wealth, Italy has been forced to develop manufactures to provide a livelihood for her large and growing population. Though handicapped by the necessity of importing most of her raw materials and fuel, she has compensating factors in her plentiful water-power (5,000,000 h.p.), her cheap labour, and the technical skill, enterprise, and organizing capabilities of her leaders of industry. Lately, she has doubled her manufacturing capacity and attained the second place in the world production of artificial silk. The north shows the greatest development, being favoured climatically, racially, and historically. Piedmont specializes in woollens at Biella, Varallo, Turin, and Pinerolo; Lombardy produces silks at Como, Bergamo, Brescia, and Milan; and artificial silk is important in the Alpine valleys, notably at Chatillon, Turin, and Milan. Schio and Vicenza manufacture woollens and silks; Genoa, Alessandria, Piacenza, Pordinone, and Chiavari cottons; and Bologna and Ravenna linens. Great progress has taken place on strictly mechanical lines, and, in this respect, the south has advantage over the north in its better situation. There are important steel works at Terni, Voltri, Savona, Naples, Portoferraio, and Piombino. Turin, Milan, Savona, and Naples are important engineering centres. Turin (FIAT cars) and Spezia specialize in motor vehicles; and Leghorn, Sestri, Genoa, and Spezia have large shipbuilding yards. Straw-plaiting is the characteristic industry of Tuscany; *majolica* and other wares are made at Faenza, Naples, and Florence, and mosaics at Florence, Venice, and Rome; Naples, Leghorn, and Brindisi manufacture coral jewellery; Venice is noted for its lace and glass, and Padua for its stringed musical instruments; and Florence, Rome, and Naples are famed for sculptured figures and *objets d'art*.

Commerce. Modern Italy is striving to gain a large share of Mediterranean traffic and trade with the Near East. The chief ports are being expanded and modernized; commercial agreements have been made with foreign nations; Trieste, Zara, Pola, and Fiume have been acquired; and the mercantile marine has grown from less than 1,000,000 gross tonnage in 1914 to over 3,300,000 to-day.

Most trade is done with Germany, France, the United Kingdom, the United States, Austria, Yugoslavia, Hungary, Czechoslovakia, Switzerland, British India, and Argentina. The chief exports are silk and woollen tissues, olive oil, wines, fruits, hemp, cotton, eggs, cheese, poultry, hides, sulphur, straw hats, rice, automobiles, canned vegetables, marble, coral, cattle, cotton and silk goods, woods, roots, artistic works, sienna earths, pastes, rags,



and boracic acid; and the chief imports are wheat, coal and coke, raw cotton, silk and wool, machinery, wrought iron and steel, timber, rubber, cured fish, chemicals, colonial produce, yarns, textiles, dyestuffs, fixed oils, tobacco, silkworms' eggs and cocoons, earthenware, plates and rails, and locomotives.

Trade Centres. The principal towns of Italy are: *Rome* (1,000,000), the political and ecclesiastical capital, and the chief centre of art and learning; *Milan* (990,000), the capital of Lombardy, the wealthiest manufacturing town, and the chief financial centre; *Naples* (841,000), the largest town and the chief port of Italy; *Genoa* (608,000), the second port; *Turin* (597,000), route and manufacturing centre; *Palermo* (390,000), the capital of Sicily; *Venice* (256,000), a great commercial and naval port; *Florence* (317,000), the centre of Italian culture and art; *Catania* (227,000), the second port of Sicily; *Trieste* (256,000), an Adriatic port, formerly the chief seaport of Austria; *Bologna* (246,000), the capital of Emilia; *Leghorn* (130,000), the chief port of central Italy; *Bari* (172,000), the largest town on the coast of Apulia; *Padua* (120,000), an ancient university town; *Ferrara* (116,000); *Messina* (182,000); and *Taranto* (108,000).

Mails and Time. Mails are dispatched from the United Kingdom to Italy three times a day. The time of transit to Rome, which is 1,191 miles distant from London by the Mont Cenis route, is 2 days. The time to Milan is about 1½ days, to Naples 2 days, and to Brindisi 2½ days.

Central Europe time, that is one hour in advance of Greenwich time, is in use in Italy, where the hours are counted from 1 to 24.

Foreign Possessions. Italy came late in the field of colonization, and her foreign possessions, mostly in Africa, are of little use as outlets for her surplus population.

Tientsin Concession (½ square mile; 10,000 population). In 1902 Italy obtained this concession of land fronting the Peiho river of China.

Aegean Islands. During the war with Turkey in 1912, Italy occupied and later acquired the islands of Egeo, Rhodes, and the Dodecanese.

Eritrea (45,754 square miles; 403,000 population; 4,400 Europeans) lies along the African coast of the southern portion of the Red Sea from Ras Casar to Ras Duneira, a distance of 670 miles. It produces grain, tobacco, cotton, coffee, durra, maize, and salt. Massawa, with a good harbour, and Asmara, the capital, are the chief towns.

Italian Somaliland (190,000 square miles; 1,200,00 population; 1,000 Europeans) extends from the borders of British Somaliland to the borders of Kenya Colony. It exports durra, sesame, gums, hides, butter, cotton, feathers, ivory, incense, sheepskins, and live stock. Magadoxo is the capital.

Tripoli and Cyrenaica. Italy's large North African colony, ceded by Turkey in 1912, includes Tripolitania with Fezzan (900,000 square miles; 600,000 population; 25,000 Europeans), and Cyrenaica (285,460 square miles; 200,000 population; 11,000 Europeans), and, as a whole, is known as Libya. Its chief exports are sheep, goats, camels, cattle, barley, esparto grass, hides, skins, wool, salt, henna, eggs, butter, ostrich feathers, ivory, gums, and sponges. Tripoli (60,000) and Benghazi (33,000) are the chief towns.



PRODUCT MAP OF
ITALY

SCALE: 110 MILES TO THE INCH.

ALBANIA

The Kingdom of Albania (10,629 square miles; 1,003,000 population) comprises the former Turkish province of Scutari, and parts of Kossovo and Yanina. Situated on the west of the Balkan Peninsula, it has for its western boundary the Adriatic Sea, and its political neighbours are Jugoslavia and Greece. Three-quarters of its people are Mohammedans, and all are divided into wild, turbulent clans. Albania is a land of formidable limestone mountains, which fall steeply to a marshy coastal plain. Much of it is uncultivated, the exceptions being the very fertile districts along the Adriatic coast, round Koritza, and on part of the central plateau, where are produced tobacco, olive oil, fruits, wine, and a little maize, under primitive farming methods. In the mountains the chief occupation is the keeping of goats, sheep, cattle, and horses, all of low physique. Copper and lignite are found near Scutari and Koritza, and asphalt is mined at Selenitza. Silk, flax, and hemp are grown and manufactured in small quantities for local use. There are few good roads and no railways. The chief exports (small in quantity) are wool, leather, hides, tobacco, sumac, olive oil, fruit, timber, and wine; while the list of imports, mainly from Italy, embodies practically all the requirements of Albanian civilization. *Tirana* (30,000), the capital, is centrally situated. *Koritza* (26,000), in the south, is an agricultural centre. Other towns are *Scutari* (24,000), and *Valona* and *Durazzo*, the chief ports.

TURKEY

Area and Population. The Republic of Turkey embraces Turkey in Europe (8,819 square miles; 1,360,000 population), and Asiatic Turkey, the greater part of Anatolia (285,597 square miles; 12,289,000 population). A special convention demilitarizes zones on either side of the Bosphorus and the Sea of Marmora, and lays down rules for preserving the freedom of the Straits in peace and in war. To-day, Turkey is a well-knit and self-contained area, inhabited by many races that still show their nomad origin, and lack of progressiveness. Mohammedanism is the prevailing religion, the Christian population of Greeks and Armenians having virtually disappeared.

TURKEY IN EUROPE

Position, Relief, and Climate. European Turkey is defined on the west by the River Maritza, on the north by a line of protecting hills, and on the other two sides by the sea. It is composed of a series of undulating plains which form, more or less, one large plateau falling gradually from the Istranja Mountains on the east to the Marmora and Aegean Seas, and containing the fertile valleys of the Maritza and the Mesta. Its short frontiers of river, mountain, and sea are their own defence, and its chief city, Istanbul (Constantinople), can be shut off from the rest of Europe, and draw its supplies from Anatolia. The waterway from the Aegean Sea to the Black Sea—the Dardanelles, the Sea of Marmora, and the Bosphorus—is strategically and commercially of great importance, providing the only all-the-year-round water passage between Europe and Russia. Generally speaking, the climate is

Mediterranean—dry, hot, droughty summers, and winter rains and snows (20 in. to 40 in.).

Productions and Industries. Agriculture is the mainstay of the people, although farming methods are primitive. The chief economic products are wheat, barley, oats, maize, rice, cotton, tobacco, flax, hemp, opium, madder, olives, roses (for attar of roses), sesamum, grapes, fruits, silk, honey, and wax. Manufactures are chiefly of the domestic type, and of local importance. There are a few cotton, silk, and woollen mills at Istanbul, and Adrianople manufactures carpets, silk textiles, and attar of roses.

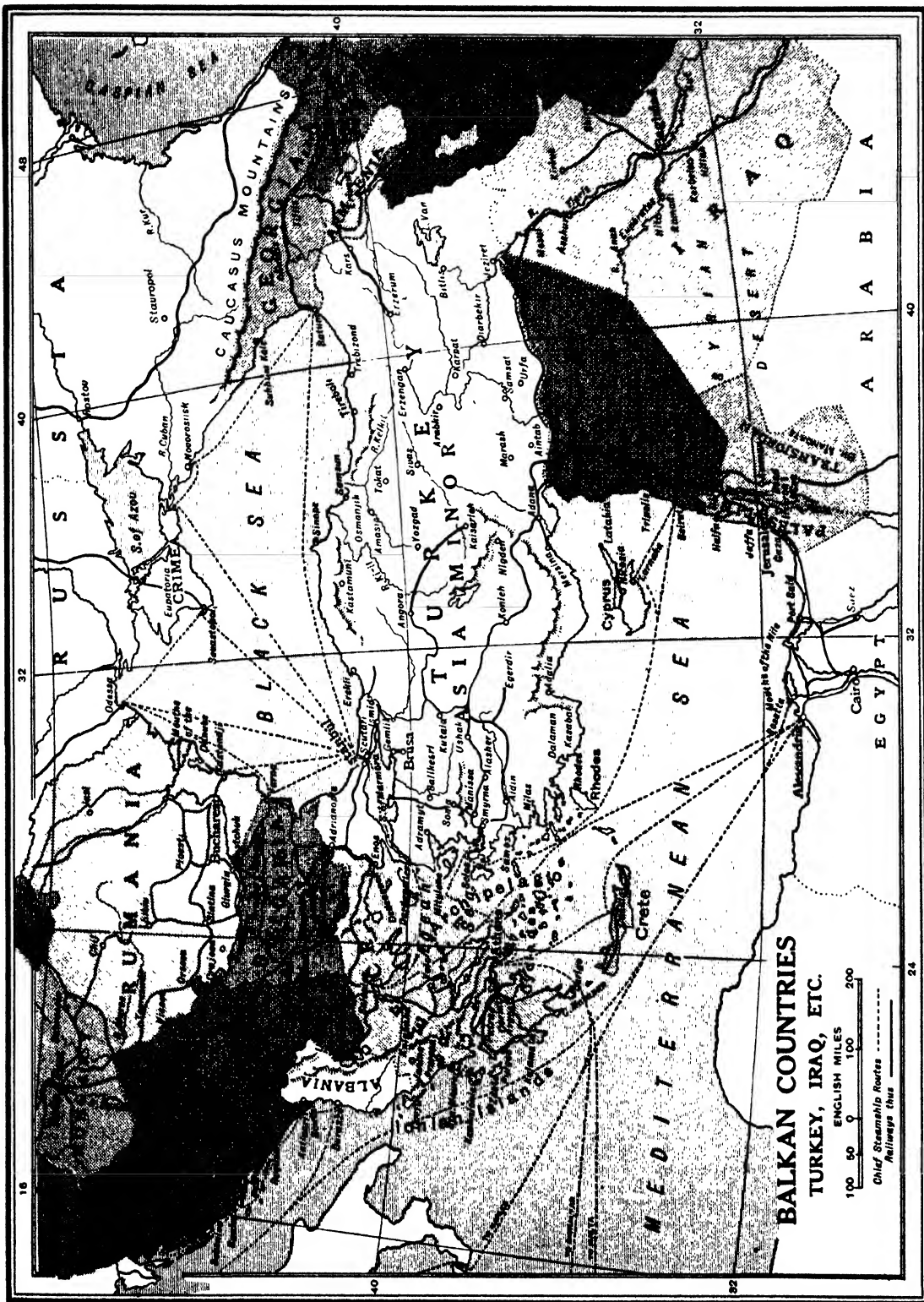
Communications and Commerce. The chief railway is the Orient Express Route from Vienna and Budapest by Belgrade, Sofia, Philippopolis, and down the Maritza Valley to Adrianople and eastwards to Istanbul. Most trade is with the United Kingdom, Italy, the United States, Japan, Germany, and France. The chief exports are raisins, silk, wheat, barley, maize, opium, valonia, nuts, sponges, honey, wax, and tobacco; and the chief imports are textiles, sugar, coffee, petroleum, rice, hardware, coal, and machinery. Through Istanbul passes a large proportion of the produce of Asia Minor. The Turk has a strong dislike to trade, and till recently left it largely to the Greeks, Jews, and Armenians, whom he hates.

Istanbul (691,000), the chief port and greatest trade centre; and *Adrianople* (35,000), a gap town and frontier fortress, are the chief towns.

Mails. Mails are dispatched from London to Istanbul twice daily. The time of transit is about three days.

TURKEY IN ASIA

Position, Relief, and Climate. Anatolia, or Asia Minor, the western extension of the plateau of Iran, is the chief country of Turkey. It is mainly a great limestone plateau (once the bed of a great sea or lake) about 3,000 ft. in height, whose rugged, irregular surface makes it a barrier rather than a bond between Europe and Asia. It rises from an average height of 2,500 ft. in the west to 6,000 ft. in the east. On the south the plateau is buttressed by the Taurus Range (really a plateau), whose mountains rise to heights of 10,000 ft., and on the north by the Pontic Range; both ranges present steep outward slopes to the sea. The only coast plains of the north are the deltas formed by the Kezil and Yeshil Irmaks; but broad river valleys open to the Aegean Sea, providing useful estuaries and harbours and offering natural routes to the interior. South of the Taurus Mountains are the rich plains of Pamphylia and Cilicia. The Anti-Taurus Range, rising near Sivas, runs south-west to the Taurus, and to the west of it and in the heart of the tableland lie salt plains, salt lakes (Lake Tuzla Gol, the largest), marshes, poor steppes, and deserts. The configuration of the country causes traffic to pass mainly east and west, and at the same time lends special value to the few convenient passes (particularly the Cilician Gate) leading to the Black Sea and the Mediterranean. Three climatic zones may be distinguished. The Northern Coast has damp enervating summers and cold winters (Trebizond: January, 43° F.; July, 74° F.; mean annual rainfall, 35 in.); the Highland Interior has a dry continental climate (Kharput: January, 22° F.; July, 77° F.; mean annual rainfall, 26.44 in.); and



the Aegean and Mediterranean Coasts have the Mediterranean climate (Izmir: January, 46° F.; July, 80° F.; mean annual rainfall, 26·12 in.).

Productions and Industries. Agriculture is the strength of Turkey, although methods are primitive and transport is inadequate. Much attention is now being given by the Government to agriculture, and farmers are gradually adopting more scientific methods, and using machinery. The olive, fig, and vine thrive on the Aegean and Mediterranean coasts. The plains of Pamphylia and Cilicia yield wheat, cotton, silk, and sesame. Western valleys yield fruits (figs, oranges, raisins), wheat, barley, rice, maize, cotton, and liquorice (Menderes). Silkworm culture is important round Izmir (Smyrna), Ismid, Aidin, and Bursa. Northern valleys grow excellent wheat, barley, tobacco, and temperate fruits. There are extensive opium fields in the neighbourhood of Izmir, Afium-Kara-Hissar, and Konya. Much of the plateau is naturally rich, and round Sivas, Konya, and Ankara (Angora) excellent wheat and fruits are grown under irrigation. Figs are largely grown in the Menderes valley and exported from Izmir; cotton is important in the lower Sanabat (Hermus) valley, and in Cilicia and round Aidin; the olive is grown chiefly in the Menderes valley and the coastlands south from the Menderes; hazel nuts grow in wonderful abundance on the eastern slopes and lowlands by the Black Sea; and tobacco cultivation is most developed in the neighbourhood of Samsun, Baffra, Izmir, Ismid, and Bursa. Madder supplies dye for local weaving, and the acorn cups of the valonia oak yield tanning material. The plateau dwellers are pastoralists, attending to the wants of their camels, wiry horses, mules, asses, goats, and sheep. Round Ankara, Konya, and Kayseri, the Angora goat, whose fine hair is greatly prized for the manufacture of mohair cloth, is reared.

Anatolia is rich in minerals, but poor transport facilities and lack of capital and capable organization hinder development. Some coal is exported from the Black Sea ports of Heraklea and Tunguldak, and deposits of lignite exist. Silver lead is found near Ismid, Sivas, and Konya; zinc at Karasu and Aidin; manganese and iron at Konya and Aidin; emery at Izmir and Aidin; meerschaum at Eski-shehr and near Bursa; gold, silver, and mercury in the Izmir district; and lithographic stone near Bursa. Manufactures are relatively unimportant, but protective tariffs that came into force on 1st October, 1929, are aiding industrial development. The production of olive oil and silk, which demands delicate manipulation, and the minor industries of carpet-making and fig-packing were formerly carried on by the Christians, and Turkish workers are not yet capable of equalling them. The manufactures are chiefly of the domestic type, and include silk, cotton stuffs, mohair cloth, Turkey rugs and carpets, sweetmeats, wine, soap, liquorice paste, and articles of beaten copper and brass. Bursa and Izmir manufacture silk, carpets, and rugs, and have many flour mills; and cotton is spun and woven on the Plain of Cilicia and Tarsus and Adana, and at Izmir.

Communications and Commerce. In Roman times good roads existed for wheeled vehicles, but, with the coming of the Turks, neglect and decay followed. To-day, the roads are principally a series of ups and downs, in urgent need of repair, and traversed with difficulty by the *araba* or native wagon. Anatolian

railways are largely of German construction. They converge on Scutari and Izmir. The Anatolian section of the Bagdad line runs from Scutari *via* Afium-Kara-Hissar (junction for Izmir), Konya, and the Taurus (east of the old caravan road through the Cilician gate) to Adana and Aleppo. Railways are being extended and considerable development of industries may follow. A train ferry across the Bosphorus connects Istanbul with Ankara, the capital, by the Anatolian Railway.

In spite of its favourable geographical position for trade, as the bridge between Europe and Asia, Turkey has never had a large transit and shipping trade. Its chief ports are Izmir, Scutari, Haidar Pasha, Ismid, Sinöpe, Samsun, Adalia, Mersina, and Marmarice. The chief exports are raisins, silk, wheat, barley, maize, opium, valonia, nuts, sponges, honey, wax, tobacco, figs, liquorice, ores, mohair, carpets, rugs, cotton, beans, olive oil, meerschaum, drugs, wool, hides, and leather goods; and the chief imports are textile fabrics, iron goods, petroleum, coal, sugar, chemicals, colonial wares, rice, engineering goods, railway material, coffee, and machinery.

Trade Centres. The chief towns are: *Izmir* (Smyrna) (154,000), the chief port and commercial centre; *Ankara* (Angora) (75,000), the capital; *Adana* (73,000), a route, railway, and agricultural centre; and *Bursa* (Brussa) (62,000), a railway and route centre.

JUGOSLAVIA

Position, Area, and Population. The Kingdom of the Serbs, Croats, and Slovenes (96,134 square miles; 13,931,000 population), which, by the law of 3rd October, 1929, was changed to the Kingdom of Yugoslavia, comprises the former kingdoms of Serbia and Montenegro, and the districts of Bosnia, Herzegovina, Croatia, Dalmatia, Slavonia, a part of Western Bulgaria, and part of the Banat of Temesvar; and forms roughly the western rectangle of the Balkan Peninsula, with the Adriatic as its western boundary. Most of the people, whether Serbs, Croats, or Slovenes, are racially Southern Slavs, and all the area was once before under Serbian rule. Difficulties confront the State in the Magyar and German elements of the population (nearly 1,000,000) in the fact that it faces unfriendly nations in almost all directions, in the various religions of its people, in the impoverishment caused by the War, and in the obstacles to its communications. Its people are largely peasants—there is no hereditary upper class, and but a small middle class owning small-holdings, self-sufficing in most of their wants, steeped in the habits of communal life, and united by historic tradition at the core.

Relief and Climate. The general aspect of the country is rugged, and the proportion of plain and plateau to mountain is small. Excepting the strip of the Plain of the Middle Danube, the whole country is mountainous, and traversed by southerly extensions of the Alpine foldings. Along the western frontier run the Dinaric Alps, presenting on their seaward side a mountain barrier, and degenerating eastwards into a jumble of broken hills and valleys. Offshoots of the Transylvanian Alps and of the Rhodope Mountains occupy the eastern section of the country, and in the south come branches of the Pinus Range. Along the whole of the Adriatic coast, and inland for a distance varying from 50 miles to 100

miles, limestone escarpments, ridges, and plateaux rise one behind the other, barren and waterless, and dissected by deep and narrow torrent-formed gorges. Beyond the limestone country is a belt of sandstones, carboniferous rocks, and *flysch* (beds of soft marls and sands), which make a varied landscape. The western drainage area into the Adriatic is narrow. Both the Narenta and the Drin cut through the mountain ridges, but only the Narenta waterway is of any importance. The Dalmatian coast is bordered by long, narrow islands, separated from the mainland by channels and lagoons, and has but few good harbours. Sea-borne trade is conducted mainly through Spalato, the Italian ports of Trieste and Fiume, and the Greek port of Salonika. In the north and east the Danube, the Morava, and the Save are the chief rivers, and the general lie of the land concentrates on Belgrade.

In the west the Mediterranean type of climate prevails; elsewhere the continental type is found. Local conditions cause great variation in temperature and rainfall. Western areas, exposed to the strong, cold *bora* have severe winters and not much rain; while places open to the south-west *sirocco* get a heavy rainfall and scorching heat in summer.

Productions and Industries. The chief occupations of the country are pastoral and agricultural. In the coastal and riverine plains and valleys the soil is fertile; in the mountains generally poor but favourable to forestry and pastoral pursuits. The bulk of the land is held by peasant proprietors, and only in Bosnia and Herzegovina are there large estates. State encouragement and help, agricultural co-operative societies, and organization into communes are marked features of the agricultural and pastoral industries. Cattle number 4,000,000; pigs, 2,600,000; sheep, 7,700,000; goats, 1,750,000; and poultry, 14,500,000. The great herds of pigs are pastured in the oak and beech forests. Maize is the chief cereal grown; but wheat, barley, rye, and oats are also important. Grapes, figs, olives, melons, oranges, and pomegranates are cultivated extensively in the west, but the plum (50,000,000 trees) is the national fruit, and is largely used for preserves (prunes) and the distillation of spirits. Apples and pears furnish an important export. Wine, olive oil, and maraschino (a cordial distilled from fermented cherries) are produced on a fairly extensive scale; and tobacco, flax, hops, rice, sugar-beet, hemp, and mulberry are being grown increasingly. The forest wealth (18,200,000 acres of beech, oak, and fir) constitutes an asset of great economic value; the timber industry is assuming growing importance, and sawmills are actively employed.

In mineral resources the country is rich. Although neither fully explored nor exploited, they offer great possibilities for the future. Foreign concerns, including several British companies, are now engaged in exploratory work and exploitation. Extensive iron ore deposits are being worked, especially at Vares and Ljubija in Bosnia. There are large deposits of lignite (annual production, 4,200,000 tons), but practically no coking coal. The chief coal-mining areas are at Ljubljana and Zagreb (Agram). Copper deposits of considerable value are worked with success. The largest and most productive copper mine is at Bor, owned by a French company. Manufactures are small, and need capital and organization to expand. There are peasant

industries of leather-working, embroidery, cabinet-making, carpets, rugs, and inlaid and metal ware. The large industries are chiefly those that utilize the agricultural, forest, and mineral resources of the country. A potential source of manufacturing strength, which is not fully utilized, except in Slovenia, lies in the water-power of the numerous swiftly-flowing rivers and waterfalls. Most of the industries work for the home trade, with the exception of saw-mills, flour-mills, and meat-preserving factories.

Communications and Commerce. Communications are poor. Roads, on the whole, throughout the country, are in disrepair, and they were not constructed to bear even moderately heavy traffic. The Danube waterway offers a means for local commerce, but for export other than to Bulgaria and Rumania, this outlet is too roundabout. Belgrade is strengthened by the large drainage that runs towards it, but the economic life of the whole country would be greatly helped if the streams ran towards the Adriatic instead of away from it. The railway system, which was for the most part constructed for strategic purposes, fails to serve efficiently the producing areas. Fuller facilities for intercourse with all parts of the Kingdom, and especially between the productive and commercial centres and the coastal and river ports, are needed. An east-to-west system (Belgrade-Adriatic Railway) and the extension of port facilities on the Adriatic are now essential. The present railways (6,200 miles) radiate from Belgrade westwards by the Drave-Save lowlands to the Adriatic and Italy; northwards by the Hungarian Plain to Budapest and Vienna; eastwards by the Danube Valley to Bucharest; southwards by the Morava Valley to Salonika; and south-eastwards to Sofia and Istanbul.

Most trade is with Italy, Czechoslovakia, Austria, the United Kingdom, Hungary, Greece, Germany, Switzerland, the United States, and France. The chief exports are maize, wheat, cattle, horses, swine, fruits, prunes, timber, meat, and cattle products; and the chief imports are textiles, iron goods, machinery, coal, chemicals, live stock, and animal products.

Trade Centres. The chief towns are: *Belgrade* (242,000), the capital and chief railway centre; *Zagreb* (180,000), a manufacturing centre; *Serajevo* (78,000), the capital of Bosnia; *Ljubljana* (60,000), a market and manufacturing centre; *Uskub* (48,000), a trading centre; *Spalato* (32,000), a Dalmatian port; and *Nish* (35,000), a railway centre.

Belgrade is 1,175 miles from London, and the time of transit is 2½ days.

GREECE

Position, Area, and Population. The Republic of Greece (50,257 square miles; 6,205,000 population), a maritime unit, consists geographically of the southern portion of the Balkan Peninsula, the northern shorelands of the Aegean Sea, the Ionian Islands, Crete, and many of the Aegean islands. Outstanding characteristics of the Greeks are the passion for politics and freedom, the keenness in trade and banking, and the high degree of culture attained, the most cultured in the Balkan area.

Relief and Climate. Greece is one of the most mountainous countries in Europe. Tangled chains cover some four-fifths of its surface, the whole

group of its peninsulas and islands being a partially submerged section of a single mountain loop of the main Alpine system. In many parts the mountains run down almost to the sea, blending harmoniously with the waters. The folds of the Dinaric Alps run through the west of the region, and are closely bordered by the great backbone which runs down the middle, right to the south of the Peloponnese (Morea), and is known in the north as the Pindus Range, and in the south by many names, ending with the five-fingered range—the "Pentadaktylon"—which runs into the sea at Cape Matapan. Numerous spurs extend from the main range, and the lofty peaks of Mount Olympus (nearly 9,800 ft.), Mount Parnassus, and Mount Taygetos, dominate the whole. The chief plains are the Aspropotamos, Achaia, Elis, and Messenia in the west, and Laconia, Argolis, Boeotia, Thessaly, Macedonia, and Western Thrace in the east. Only Macedonia has important rivers—the Vardar, Struma, Myesta, and Maritza, flowing to the Aegean Sea. Lakes abound, and the large body of water in Boeotia, known as Copais, is now a largely reclaimed fertile area. The coast, mountainous and deeply indented, is immense in proportion to the size of the country, and provides many good harbours. Across the low and narrow Isthmus of Corinth, the Gulfs of Corinth and Aegina are united by the Corinth Ship Canal, which shortens the voyage from the Ionian Sea to the port of Athens by 202 miles.

Climatically, Greece is governed by the two factors of mountain and sea. The climate is, therefore, marked by extremes of heat and cold, common to mountainous countries surrounded by the sea. On the low ground the typical Mediterranean climate prevails. The rainfall is considerable in the west, but small in the east. Heat and cold vary so much that the mean annual temperature is not higher than 62° F. Athens has 81° F. in July and 47° F. in January; while Salonika has 79° F. and 41° F. respectively. Athens has a mean annual rainfall of 16 in.; Salonika 17 in.

Productions and Industries. Greece is mainly an agricultural country, more than half of its people gaining a livelihood from the soil by producing more largely the luxuries than the necessities of life. Agriculture suffers from the dryness of the climate, the thin and often infertile soils, the backward methods adopted, and the lack of co-operative societies and agricultural banks. Peasant proprietorship is common. Maize, oats, and barley are extensively cultivated, but there is always a great deficiency of wheat. The chief fruits are olives, oranges, lemons, dates, almonds, pomegranates, figs, citrons, mandarins, peaches, apricots, pears, cherries, nuts, sultanas, and currants. Currants are grown chiefly along the sea-coast, and especially along the shores of the Gulf of Corinth, the coast of the Western Peloponnese, and on the islands of Cephalonia, Levkas, and Zante. Most of the currant imports of Western Europe come from Greece and Asia Minor. The cultivation of the mulberry is important. Tobacco is grown over a wide area, and especially in the east. The best brands come from the districts of Lamia, Agrinion, Xanthi, and Kavala. Turkish and Egyptian cigarettes are mainly made of Greek tobacco. Wine of a poor quality is produced. Cotton is grown in Thessaly and Boeotia, and rice in Macedonia; and Hymettus is noted for

its honey. In the mountainous areas pastoral occupations predominate. Sheep number 6,000,000; goats, 4,000,000; cattle, 700,000; asses, 244,000; and mules, 128,000.

The most abundant minerals are silver, lead, and marble, largely monopolized by Attica in the Laurium mines and Pentelikon quarries. Iron is mined at Laurium, Euboea, Scriphos, and Larimna; emery at Naxos; sulphur at Santorin; chrome at Pheersala; and magnesite at Euboea. Lignite is found, but true coal is absent. Want of coal, little water-power, poor transport, and lack of capital prevent great industrial development. The chief manufactures are olive oil, flour, textiles, ship-building, wine, butter, and soap. Around Athens and the Piraeus there are flour mills and textile factories.

Communications and Commerce. The roads are poor, and railways (1,500 miles) gravely inadequate. A railway from Athens passes through Larissa to Salonika, near which a line runs west to Monastir in Yugoslavia. From Salonika the main line runs up the Vardar Valley, sending a branch to Dede Agach to join the Orient Express route south of Adrianople. A line from Athens follows the northern coast of the Peloponnese to Patras by way of Megara and Corinth, and continues round the western coast to Kalamata. Another line crosses the Morea from Corinth to Kyparissia. Thessaly is served by a line running from west to east across the main route between Athens and Salonika.

Throughout Greek history shipping has been important, and the mercantile marine of to-day does much of the carrying trade of the eastern Mediterranean. Most trade is carried on with the United Kingdom, France, Russia, Germany, Italy, Austria, Hungary, and the United States. The chief exports are currants, tobacco, wine, olive oil, figs, cognac, hides, lead, iron ore, magnesite, iron pyrites, chrome ore, emery, marble, sponges, and valonia; and the chief imports are grain, cotton, fish, coal, textiles, animals, building timber, hides, paper, sugar, iron and steel goods, glass and earthenware, silk goods, and chemicals.

Trade Centres. The chief towns are: *Athens* (301,000), the centre of ancient Greek culture and the modern capital; *Piraeus* (135,000), the port of Athens; *Salonika* (171,000), one of the chief ports of Southern Europe; and *Patras* (53,000), the Morean "currant" port.

Mails and Time. Eastern European time, two hours in advance of Greenwich time, is in use in the Balkan States. Mails take about four days to reach Athens.

BULGARIA

Position, Area, and Population. The Kingdom of Bulgaria (39,814 square miles; 6,006,000 population), the smallest, with the exception of Albania, of all the Balkan States, is bounded on the north by Rumania and the Danube, on the west by Yugoslavia, on the east by the Black Sea, and on the south by Greece and Turkey. Three-quarters of its people are Bulgars, a fusion of Mongol and Slav blood, tenacious, thrifty, persevering, patient, and land-hungry.

Relief and Climate. The Balkan mountains, running in a shallow crescent-shaped curve from the River Timok south and east to the Black Sea, divide Bulgaria into two large parts—the gently sloping

Balkan Foreland, a limestone region, deeply dissected by rivers flowing to the Danube; and the Rhodope Highlands with the Struma Valley and the Upper Maritza basin to the south.

The climate, as a whole, is characterized by cold, severe winters, hot summers, and rain at all seasons; though the Upper Maritza valley verges on the Mediterranean type, and the Black Sea coast on the Steppe type. The rainfall varies from 20 in. to 30 in., and the temperature range is from 32° F. to 77° F.

Productions and Industries. More than 75 per cent of the people are occupied on the land. There are few large estates, and half of the people live on small holdings of less than 6 acres. Most of the holdings are owned by their cultivators, and communal ownership of woodland and pastureland gives the peasants the rights of cutting wood and of grazing their animals. Modern methods of cultivation are largely absent. More than one-sixth of the country is forested; nearly one-half is pasture land; and a quarter is arable. Wheat, the chief crop, and maize are grown in Danubian Bulgaria; tobacco, roses, and rice on the southern and eastern plains; and fruit in the basins. Tobacco is cultivated chiefly in the Khaskhovo and Philippopolis districts. In the provinces of Philippopolis and Stara Zagora are the famous rose gardens (12,600 acres). Both red and white roses are used in the distilling of the attar of roses, and the best gardens are at Kazanlik, Karlovo, Klisura, and Stara Zagora. Sugar-beet is grown in the province of Sofia; and wine is produced in the Blue Danube region. Sericulture is increasing in the south. Sheep, cattle, buffaloes, goats, ponies, horses, mules, donkeys, and pigs are numerous. Copper, lead, manganese, marble, limestone, and iron are worked; but coal (1,000,000 tons annually), from the mines at Pernik and Trevna, is the only mineral of importance exploited as yet. Attempts are being made to establish manufacturing industries by high protection and bonuses. Cloths, carpets, braids, and serges, chiefly for home consumption, are manufactured at Pirdop, Karlovo, and Trevna, and textiles at Varna.

Communications and Commerce. There are 1,845 miles of railway, chiefly single line. The Orient Express route passes through Yugoslavia to Sofia, and thence to Philippopolis and Mustafa Pasha, and across the Chatalja Valley to Istanbul; and a north-south trans-Bulgarian line runs from the Danube past Plevna to Sofia and the Struma Valley. Burgas has railway connection with Rustchuk, and Varna with Philippopolis.

Most of the foreign trade is with Germany, the United Kingdom, Italy, the United States, France, Belgium, and the neighbouring states. The chief exports are cereals, live stock, tobacco, cocoons, reeled silk, attar of roses, eggs, skins, hides, and cheese; and the chief imports are textiles, iron and steel goods, machinery, dyes, paints, oils, glass, wax, colonial produce, fish, chemicals, paper, rice, leather, coal, and building materials.

Trade Centres. The chief towns are: *Sofia* (213,000), the capital and the chief commercial centre; *Philippopolis* (85,000), the chief commercial centre of the south; *Varna* (61,000), the chief Black Sea port; and *Rustchuk* (46,000), the chief Danube port.

Mails are dispatched from Britain three times

daily, and the time of transit to Sofia, 1,416 miles from London, is about three days.

RUMANIA

Position, Area, and Population. The Kingdom of Rumania (122,282 square miles; 18,025,000 population) consists of Wallachia, Moldavia, Bessarabia, Bukovina, Transylvania, with parts of the Banat, the Dobrudja, Crizana, and Maramuresh. A land of many frontiers, it is bounded on the north by Czechoslovakia, Poland, and Russia; on the east by the Black Sea; on the south by Bulgaria; and on the west by Yugoslavia and Hungary.

Relief and Climate. Rumania is a land of great physical variety, ranging from the impressive beauty of the mountainous Carpathian backbone to the dreary Bessarabian plain. Between the Carpathians and the Bihor Mountains lies the Transylvanian plateau; and at the end of the Carpathians is the elevated eastern Banat. Moldavia, Bessarabia, and Bukovina are mainly hilly; while the Dobrudja is hilly in the north and marshy along the coast. South of the Transylvanian Alps stretch the vast fertile plains of Wallachia, Oltenia, and Bessarabia; and along the Black Sea coast is a great chain of lakes. Of the rivers the Danube and the Dniester are of prime importance, and the Sereth, Pruth, Olta, and Argesh are useful highways for the lumber trade.

The climate is markedly continental, with sudden and treacherous changes of temperature. Except in the hills, the summer is a time of intense heat (Bucharest often 100° F. in the shade); while in the winter, 20° F. is not an uncommon temperature. The rainfall is small on the plains (20 in.), but in the mountains is over 40 in.

Productions and Industries. Rumania is primarily an agricultural country (41·8 per cent of the total area is arable land). Recent legislation has resulted in the breaking up of the large estates, and the handing over of 90 per cent of the cultivable land to the land-hungry peasants. Wheat (8,000,000 acres) and maize (9,000,000 acres) are the two chief crops, the latter being mainly for home consumption. Other important crops are barley, oats, rye, millets, beans, peas, colza, flax, hay, hemp, and tobacco. Vines are cultivated on the hill slopes of Moldavia and Western Transylvania, and in Bessarabia. Fruit of every kind is abundant in the eastern provinces. There are 2,000,000 horses and donkeys; 6,000,000 cattle; 12,500,000 sheep and goats; and 3,000,000 pigs. Dairying is destined to become a leading industry.

After agriculture, the production of petroleum is the most important industry. Large deposits of petroleum are found in the region of the hills, particularly in the districts of Prahova, Dimbovitza, Bazau, and Bacau. Prior to the Great War the output exceeded 2,000,000 tons annually, and this is now surpassed. A great proportion of the oil is carried by pipe-line to Constantza. In Sarmasel, Transylvania, natural gas is obtained. Gold (the most important supply in Europe), with less silver, copper, and lead, is mined in the centre of Transylvania, near the source of the Körös river. Salt is obtained in the region of the Lower Carpathians from Bukovina to the west of Oltenia. Lignite (2,300,000 tons), coal (300,000 tons), and iron are raised in Transylvania and the eastern Banat. Manufactures are in their infancy. Transylvania is

the chief industrial area. There are great ironworks at Resitza, and woollen goods are made at Brasso and Kolozsvár.

Communications and Commerce. Road transport is negligible, and the railways (7,500 miles) are in an unsatisfactory condition. Bucharest is a terminus of two great European expresses, the Simplon and the Orient. The main Rumanian traffic on the Danube, is downstream from Galatz and Braila to the Black Sea. An international commission, with headquarters in the free port of Sulina, controls the navigation of the mouths of the Danube, but the inland waterways are in the hands of Rumania. Air traffic is developing, and regular lines run from Bucharest to Belgrade, Praha, Budapest, and Paris.

Most trade is carried on with the neighbouring states, the United Kingdom, Germany, France, Italy, Belgium, Switzerland, and the United States.

The chief exports are petroleum, wheat, maize, barley, oats, timber, cattle, salt, hides, fruits, and eggs; and the chief imports are textiles, machinery, metal goods, raw cotton, wool, colonial produce, coal, chemicals, leather goods, and sugar. Sulina and Constantza (Black Sea ports), and Braila and Galatz (Danubian river ports) are the chief outlets.

Trade Centres. The chief towns are: *Bucharest* (631,000), the capital and chief commercial centre; *Kishinev* (117,000), a grain and live stock centre; *Czernowitz* (111,000), the capital of Bukovina; *Ismail* (80,000), a river port; *Iasi* (103,000), the capital of Moldavia; *Galatz* (101,000), a river port; *Temisioara* (72,000), a distributing centre; *Braila* (66,000), a river port; *Oradea Mare* (65,000), a wine centre; and *Constantza* (30,000), a growing winter port.

Mails are dispatched to Rumania several times daily, and the time of transit is a little over 2½ days.

NORWAY

Position, Area, and Population. The Kingdom of Norway (124,553 square miles; 2,810,000 population), which separated politically from Sweden in 1905, occupies the western and northern portion of the Scandinavian Peninsula, extending from north to south for about 1,100 miles, with a width varying from 10 miles to 250 miles. Apart from the few Lapps and Finns of the north, its population is essentially of Nordic stock, well endowed physically and mentally, and characterized by independence, versatility, and virility.

Coast Line. The coast is remarkable for its length (12,000 miles), the number of its long and narrow fiords, and its Skjaergaard, or fence of skerries. Formed by glacial and river action and earth movements, the fiords plough deep into the land, their rock walls rising sheer from sea-level to snow-line. They provide excellent harbour accommodation, but give access to no large fertile hinterlands. The best-known fiords are the Sogne (more than 100 miles long), the Trondhjem (80 miles long), and the Hardanger (70 miles long). Practically the whole of the coast line, from Stavanger northwards, is sheltered by the Skjaergaard, which consists of small rocks and islands in the south, and of larger islands in the north. Vestfjord (in reality a strait) cuts off the lofty Lofoden Islands from the mainland.

Relief. Most of Norway consists of an elevated, barren, and uninhabited plateau, which descends gradually towards the east, and falls almost precipitously to the sea on the west, restricting human habitation to the coast and to the deep enclosed valleys. North of Røros the plateau falls towards the low district bordering on the Trondhjemfjord (Trøndelagen), which cuts the tableland into a northern and a southern division. In the north, the Kiolen or Keel Mountains reach heights of nearly 7,000 ft., before sinking to the Finmark plateau. South of the Trøndelagen depression are several mountain groups. On the north-east side of Gudbrandsdalen are the Dovrefjeld (Snehaetta, 7,550 ft.) and the Rondanefjeld. The highest peaks are in the area bounded on the north by the Nordfjord and the River Otta, and on the south by the Sognefjord and the River Vinstra. Between the two fiords lies the Jostedal Brae, with the largest perpetual snowfield in Europe and twenty-four glaciers; while between the rivers is the Jotunfjeld, containing the two peaks, Glittertind (8,400 ft.) and Galdhøpiggen (8,500 ft.). East of the Hardangerfjord lies the great ice-cap of the Folgefonna, and farther inland the wide plateau of the Hardanger Vidde. It has been calculated that over 2,000 square miles of the country are covered with perpetual snow and ice. Numerous streams flow westwards and southwards; their courses are short and rapid, and often broken by cataracts and falls of great height. They are of little use for navigation, but provide excellent water-power for manufactures. The chief western rivers are the Namsen, Tana, Alten, Vefsen, Gula, and Orkla. More important and larger are the Glommen and its tributary, the Laagen, of the south-eastern basin.

Climate and Vegetation. Elevation and distance from the sea exercise almost more influence than latitude on the climate. Westerly winds from the Atlantic cause even temperatures in the marine

districts and ice-free ports, while those of the Baltic in lower latitudes are icebound in winter. Inland and upward the temperature falls considerably. Thus, Karasjok is nearly 7° F. colder than Vardo; and the western coast between Lindesnes and Trondhjem has an annual temperature of about 45° F., while that of Røros (2,064 ft.) is only 31° F. Sea effects are seen in the figures of the mean January and July temperatures of Christiansand (34.5° F.; 56.5° F.), and Bergen (34.0° F.; 58.5° F.); while Oslo illustrates interior conditions (24.3° F.; 62.8° F.). Rain occurs at all seasons, but is heaviest in the autumn and winter. Bergen has an average annual precipitation of 71 in.; but to the north of it the fall is 100 in. A line joining the heads of the fiords from the Lofoden Islands southwards marks roughly the landward limit of an annual fall exceeding 40 in. throughout; between this and the outer coast, from Stad to Stavanger, is a belt with over 80 in. Over the driest parts of the interior, the Dovrefjeld and Finmark, the rainfall is less than 21 in., and in places as low as 12 in. Its northerly position causes Norway to have very long periods of daylight in summer and equally long periods of darkness in winter. At North Cape (Lat. 71° N.) the sun is always above the horizon from 12th May to 29th July, and always below the horizon from 18th November to 23rd January. With so many consecutive hours of summer light, plants quickly accomplish their cycle of growth, barley maturing as far as 70° N. lat.

In the frozen north, the tundra vegetation of mosses and lichens supports the reindeer herds of the nomadic Lapps. Conifers fill most of the uncleared land up to 2,500 ft., spruce predominating in the east, and pine or Scots fir in the west. At lower levels deciduous trees intrude, but are of importance only in the extreme south, where birch, aspen, and rowan are prevalent. The birch persists some 1,000 ft. above the coniferous forests, and provides the necessary fuel for the *sæters* (wooden huts) in the upland pastures. Higher still is found a scrub of dwarf birch, willow, and juniper, after which come the snow and ice fields of the high fjeld.

Productions and Industries. *Agriculture.* Nearly 60 per cent of Norway consists of bare mountain tracts, 7.5 per cent of lakes and swamps, and 22 per cent of forest. Thus, there is a remarkably small extent of country fit for cultivation; at the present time, only about 3.4 per cent of the entire surface is cultivated. A combination of agriculture and fishing (coastal and deep sea) enables the greater proportion of the people to live. The hardier cereals—oats, barley, and rye—are the chief grown. Potatoes are a very important crop, for on them the Norwegian farmer depends largely for his food; they are as much used as in Ireland. The farms, dotted along the river valleys, are small, but utilized to the utmost. The largest tract of arable land lies north of Oslo. Tourists are lodged in many of the farm houses in summer, and they provide a useful source of income to the Norwegian farmer in eking out his bare existence. Vast quantities of cherries, pears, and apples are produced in the Hardanger district. Cattle (1,152,000), fed chiefly on the meadow lands and along the sides of the fiords, are the chief animals

reared. Norwegian farming is chiefly concerned with live stock and the dairy; something like 70 per cent of the cultivated ground is used for hay production, and crops are utilized as fodder. Food products have to be imported. During the summer the herds are taken to the high tributary valleys, where they are watched and tended from *saeters*. There are many co-operative creameries; and eggs, condensed milk, and canned milk are important exports.

Fishing. The long and deeply-indented coast line, together with the favourable feeding-ground for fish off the coast, encourages the fishing industry. The chief fish caught are cod, herring, mackerel, salmon, and sprat (brisling, substitute for sardine). The principal centres are Bergen, Stavanger, Haugesund, Trondhjem, Tromsø, and the Lofoden Islands. Cod fishing is the most important of all, and ranges from the Lofoden Islands to Finmarken. It is carried on chiefly from January to May, and the Lofoden Islands are then visited by some 40,000 men and boys. The herring fishery, though very important, is neither so vast nor so certain as the cod fishery. From Stavanger to Tromsø is the range of fishing; there are both winter and spring fisheries, the latter being the more important. Mackerel fishing is of small extent, and is confined largely to the southern ports. Salmon are caught in the fiords and at the mouths of the rivers. In the far north there are whale and seal fisheries, and whalers proceed to Iceland and Greenland and Antarctic waters from Tromsø, Hammerfest, Aalesund, and Tønsberg.

Forestry. Lumbering is of great importance, Norway being one of the chief timber countries of Europe. Pine and fir are the chief woods, and their durable character, caused by slow growth and the rigours of winter, makes them exceedingly valuable. Wood-pulp, cellulose, and matches are becoming of greater importance. The south and east are the main timber regions, and especially the Glommen basin. The chief timber and pulp-exporting towns are Oslo, Drammen, Frederikstad, Namsos, Porsgrund, Arendal, and Trondhjem.

Mining. Copper is worked at Røros in the Glommen valley and at Sulitelma, and silver is mined at Kongsberg. Gold is found at Eidsvold, infusorial earth round Stavanger, coal in the island of Andø, and granite on the margins of Christiania Fjord. Electrical smelting of iron ore is carried on in various parts.

Manufactures. Though Norway lacks coal, it has abundant water-power (12,000,000 h.p.), and its moist climate favours textile manufactures. Water-power is being increasingly used in the pulp, paper, electro-chemical, and electro-metallurgical industries. From Drammen to Christiansand paper and pulp are the chief manufactures. Skien smelts iron and has great saltpetre works; flour-milling is important at Moss; and Sarpsborg's chief industry is the condensing of milk. Porsgrund and Kragerø

export ice; and Frederikstad and Frederikshald export granite "setts" and matches. The centres of the electro-chemical industry are Rjukan, Notodden, and Odda.

Carrying Trade. Like the Phoenicians of old, the Norwegians have been forced to become sailors and carriers of the goods of other nations. Norway's merchant fleet is large (2,000,000 tons), and its carrying trade comprises about one-fourteenth of the world's tonnage.

Communications. Communications are largely by sea. There are about 2,600 miles of railway. The first railway opened (in 1854) was the Oslo to Eidsvold line. To-day, the south-east is well served, and there is a choice of routes from Oslo to Trondhjem, following the Glommen and the Gula, or ascending Gudbrandsdalen, and taking the line of the old Dovre road. The Gudbrandsdalen line has been completed down Romsdalen to the sea. In 1909, the opening of the Oslo to Bergen line gave proof of Norwegian engineering skill. North of Trondhjem, which is connected with Sweden *via* Storlein, the railway reaches Namsos. Farther north, the only railway is the line conveying Swedish iron ore, which traverses Norway from Rikograensen to Narvik on the Ofoten fjord.

Commerce. Most trade is carried on with the United Kingdom, Germany, Sweden, Russia, France, Denmark, and Holland. The chief exports are timber, paper, wood-pulp, ships, fish, cod-liver oil, train oil, tar, resin, pitch, turpentine, matches, skins, furs, stone, minerals, calcium carbide, condensed milk, margarine, eggs, butter, jam, tinned goods, and ice; and the chief imports are woollen goods, chemicals, coal, coke, hardware, machinery, meat, pork, corn, sugar, and coffee.

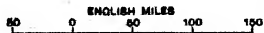
Trade Centres. The chief towns are Oslo (258,000), the capital and most important port; Bergen (97,000), a great fishing centre; Trondhjem (55,000), a great tourist centre; Stavanger (46,000), a fish-canning centre; and Drammen (26,000), a timber exporting centre.

Svalbard (formerly Spitsbergen) (25,000 square miles) is a mountainous Arctic archipelago, consisting of five large and many small islands, and given to Norway by the Peace Conference. West Svalbard (12,000 square miles), the main island, is a centre for whaling, sealing, and wild-fowl hunting. There are extremely valuable iron and gypsum deposits, at present undeveloped, and also extensive coal seams now being worked (annual output 250,000 tons). Longyear "City" (500), on Advent Bay, is the chief settlement, and the only place where mining is carried on.

Mails and Time. Mails are dispatched twice a day from England to Norway. Oslo is 656 miles distant from London, and the time of transit is about 2½ days.

Central or Mid-Europe time, that is time one hour in advance of Greenwich time, prevails in Norway.

NORWAY & SWEDEN (SCANDINAVIA)



Principal Steamship Routes -----

Principal Railways ———



NORWAY AND SWEDEN

(SCANDINAVIA)

SWEDEN

Position, Area, and Population. The Kingdom of Sweden (173,146 square miles; 6,142,000 population) occupies the eastern part of the peninsula of Scandinavia, having Norway on the west, and the Baltic Sea on the east. Her population is mainly concentrated in the southern and midland provinces, and along the coast. As a race the Swedes are energetic, persevering, level-headed, freedom-loving, and progressive. They are tall Nordics with fair hair and blue eyes.

Coast Line. The Swedish coast is normally a "bay" coast, relatively smooth and unbroken, and backed by low sloping country. No sea arms penetrate far into the interior, but many of the river mouths are wide, and good harbours are not wanting. In the north the coast is rising at the rate of 5 ft. a century, while, in the extreme south, it is sinking. A skerry fence, most marked off the mainland opposite the Åland Islands, contains the islands of Gothland and Öland. All the harbours north of Stockholm are frozen during the winter months, and the Baltic is tideless.

Relief. The country consists mainly of the longer and gentler slope of the Scandinavian Highlands, which is crossed by numerous parallel rivers having south-easterly trends, and often widening out into lakes. Only a small portion of the country is mountainous. The greatest heights are in the north-west, where are Kebnekaise (7,004 ft.), and Sarjektjokko (6,998 ft.). The south is occupied by the Gothland Plateau, above which the main tableland rises. Among the chief rivers are the Dal, Tornea, and Motala draining Lake Wetter to the Baltic, and the Göta draining Lake Wener to the Kattegat. These rivers are slower than those of Norway, but are little used for navigation. There are many lakes; those in the south are among the largest in Europe, and include Lakes Wener (2,100 square miles), Wetter (730 square miles), and Mälär. They are of prime importance for commerce, and almost cut off the flat, fertile, and populous southern Sweden from the rest. Everywhere there is evidence of the ploughing and grinding effects of the glaciers of the Ice Age. In the south-west, deposits of fine clay and mud give fertile soils; in the centre and north a rough till is suited to forest growth; but on the east there are great stretches of coarse morainic material, gravel, rough sand, and boulders, where cultivation is impossible. The fertile plains of Skåne consist mainly of calcareous boulder clay, ground in the ice mortar from Cambrian and Silurian deposits.

Climate and Vegetation. Climatologically, Sweden is neither so wet nor so warm as Norway. It is on the border between continental and oceanic influences, and in the north lies open to Arctic influences. On the northern frontier the mean annual temperature is 27° F.; in the south 45° F. Haparanda has about 32° F.; Umeå, 35° F.; Hernösand, 38° F.; and Stockholm, 42° F. In the north-east, spring begins in May, summer in June; in the south-west, spring begins in March, summer in mid-May. The average annual rainfall is about 20 in., the amount being greatest in the south, west, and south-west (Göteborg, 35 in.), and least in the east (Kälmär, 13 in.). Most rain falls in summer (except in the marine

south-west, where it is typically in autumn), and the minimum in spring.

South of the great lakes are fertile, agricultural provinces (especially Skåne), and here the oak, beech, and elm flourish. From Gothenburg (Göteborg) to Stockholm stretches the industrial and mining region, where lake, forest, field, and meadow are mingled in inextricable confusion. To the north of this zone is the coniferous forest zone, embracing all the interior of the country right up to the bleak, treeless mountains and tundra of Lapland. Pines, firs, spruces, larches, birch, aspen, and rowan are the typical trees.

Land and Water Routes. The rivers are of great importance to the timber industry, possessing space, depth, and length for floating operations. A direct waterway for vessels of light draught from Göteborg to Söderköping is provided by the Göta Canal system (240 miles; canalized portion 55 miles; 58 locks), which utilizes the Göta River, and Lakes Wener, Wetter, and Boxen. There are over 10,000 miles of railway. From Stockholm, a line runs through Upsala to Gällivara (at Haparanda it links up with the Finland Railway); a second runs westward to Trondhjem; and a third runs from Luleå to Narvik. Lines also run west from Stockholm to Oslo and Göteborg, and south through Norrköping to Karlskrona, Malmö, and Trelleborg, where the train ferries to Copenhagen and to Sassnitz (in Germany) link up Sweden with the rest of Europe.

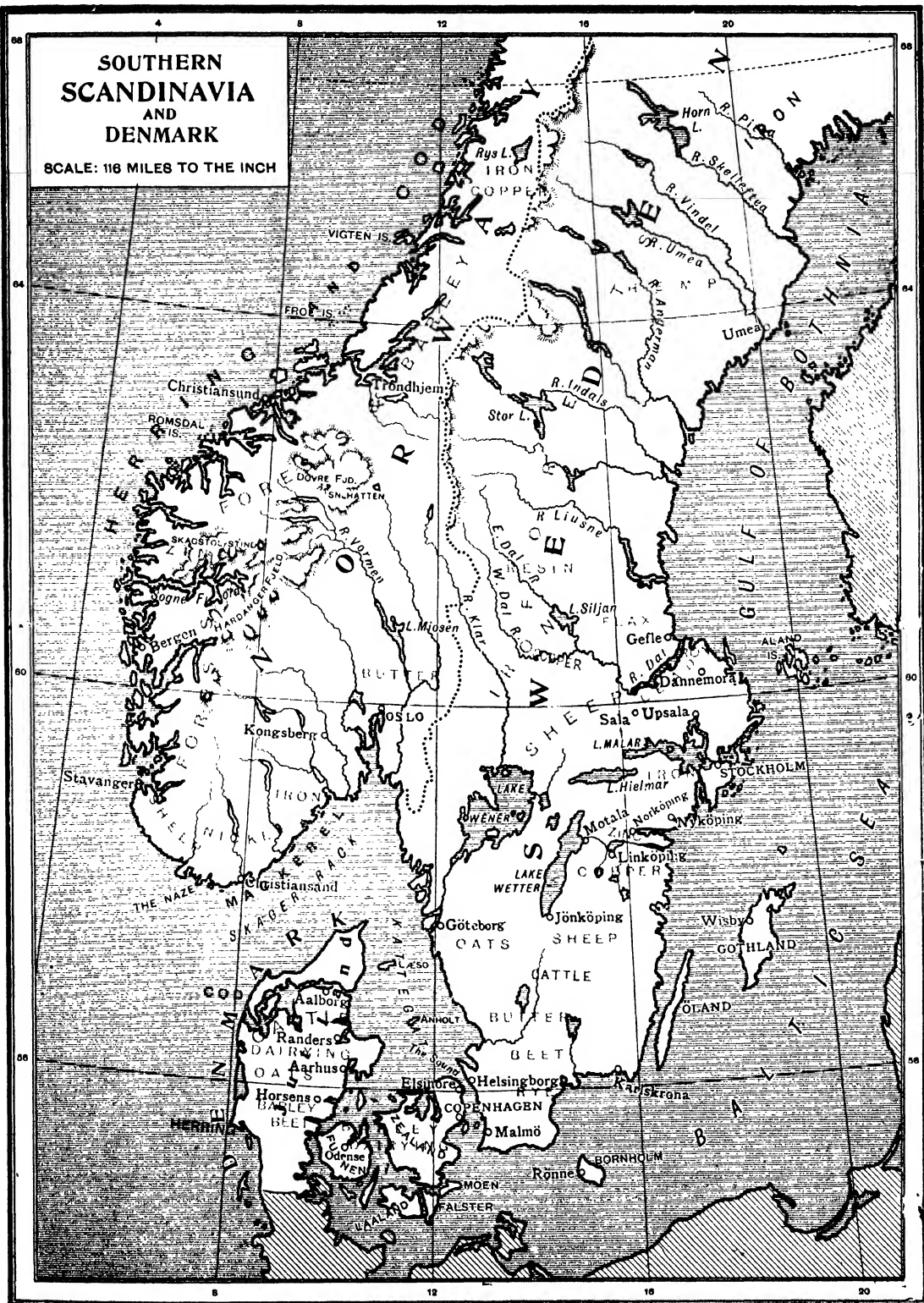
Productions and Industries. *Agriculture* is a more important industry in Sweden than in Norway, largely owing to more fertile and wider farming tracts; but the crop land is only about 6 per cent of the entire surface. Oats are the chief crop, followed by rye, barley, potatoes, colza, and wheat. The chief agricultural region lies in the south, especially the coast lands bordering the Kattegat, where the south-west winds have easy access. Root crops for winter food are important. Farming is highly scientific, and electric power is utilized for farm work. Recently, there has been an extension of beet-growing, and the cultivation of apples, pears, cherries, and raspberries is being developed. Cattle are the chief animals reared; but sheep, horses, and pigs are important. Dairying is of growing importance, especially in the region facing Denmark. Göteborg is the chief butter port. The lack of labour has led to the invention and use of mechanical appliances, such as cream separators. Co-operative dairies have been established on the latest scientific principles.

Fishing. The fisheries (river and sea) are not so important as those of Norway; but many Swedish boats are actively engaged in fishing for herring and eels in the Baltic waters, and for mackerel, herring, and cod off the western coast.

Forestry. Over 50 per cent of Sweden is forested, and, as in Norway, lumbering is one of the staple industries. Pines and firs predominate, being specially suited to the climate and the sandy soil. The main forest region lies between 60° and 64° N. Lat. Sixty per cent of the total exports consist of forest products. The rivers not only provide excellent transport, but supply the power for the mills in

SOUTHERN SCANDINAVIA AND DENMARK

SCALE: 116 MILES TO THE INCH



NORWAY AND SWEDEN

(SCANDINAVIA)

which the logs are converted. Far in the interior, 100 miles and more from the coast, the trees are felled in winter and sleighed easily over the snow to the banks of the frozen rivers. The spring floods afterwards carry the logs, either singly or in huge rafts, to the saw-milling centres, such as Sundsvall, Gefle, Umeå, Hernösand, Söderhamm, Skelleftea, Vestervik, and Kalmar. Deals, pit-props, sleepers, door and window frames, and plywood are turned out in great quantities; paper mills and cellulose pulp factories toil in vain to satisfy the demands of the world's printing presses; carpentry, box, and case-making works have sprung up on every side; and the safety-match factories (Jonkoping) are on a very large scale. An excellent system of conservation secures the replanting of every forest area cleared, so that the supply is being renewed continually.

Mining. Mining is a most important department of Swedish industry. Iron is the chief mineral worked, but copper, lead, manganese, coal, cobalt, nickel, alum, sulphur, porphyry, marble, and zinc are also mined or quarried. Gold and silver are mined in small quantities. There are two main iron-fields, the "Lapland," between Lake Torneå and Gellivara, and the Central or Grangesberg (Dannemora); and Luleå and Oxelösund are the special iron ports. Lapland has its chief mines at Luossavara, Kiruna, and Gellivara, and for the service of this ore-field a railway has been constructed from Luleå to the Norwegian ice-free port of Narvik. For centuries Sweden dominated the international iron market, owing to her plentiful and rich iron ores, free from phosphorus, and her abundance of charcoal for smelting, which enabled her to produce the highest grade steel. After the discovery of the process whereby coke could be used for smelting ore, the industry was gradually transferred to coal-producing countries, the ore being transferred for treatment where fuel was plentiful. Sweden, however, has maintained her pre-eminence in the manufacture of the highest quality of steel, which is greatly in demand for machine tools. Some 6,500,000 to 7,500,000 tons of iron ore are annually produced, and approximately nine-tenths of this quantity is exported. Copper is mined at Falun in the heart of Dalarne, Sala has silver-lead mines, Ammeberg zinc mines, and Helsingborg coal mines.

Manufactures. Swedish manufactures are fast developing. The mechanical power provided by the numerous streams is utilized in the timber, iron, and electro-chemical industries. Cream separators, lighthouse apparatus, telephone supplies, motors, and many kinds of electrical machinery are among the highly-specialized products of the metallurgical industries. Textiles are manufactured at Norrköping, Göteborg, Stockholm, and Jönköping; iron goods at Dannemora; matches at Jönköping and Göteborg; and wooden ships at Göteborg. The porcelain factories of Rörstrand and Gustavsberg, and the glass factories of Kosta and Rejmyre, produce wares that have achieved a high reputation. Sweden occupies a leading position in the manufacture of electrical apparatus for lighting, power transmission, motors, telegraphy, and telephony. Of a potential 6,000,000 h.p. she utilizes 1,500,000 h.p.

Commerce. Most trade is with the United Kingdom, the United States, Germany, Denmark, France, Russia, Norway, and the Low Countries. The chief exports are timber and wooden goods, iron ore, butter, machinery and implements, iron and steel, paper, wood pulp, zinc, dairy produce, matches, and stone; and the chief imports are coal, coke, metal goods, machinery, foodstuffs, sugar, coffee, textiles, raw materials for textiles, manure, fish, oils, wine, tobacco, and spices. Göteborg, Stockholm, Malmö, Halmstad, Norrköping, Helsingborg, Christianstad, Karlskrona, Söderhamm, Sundsvall, and Hernösand are the chief ports.

Trade Centres. The chief towns are *Stockholm* (502,000), the capital and chief commercial centre; *Göteborg* (243,000), the most important and accessible port; *Malmö* (121,000), an iron and shipbuilding centre; *Norrköping* (61,000), a textile and hardware centre; *Helsingborg* (56,000), a port; *Gefle* (39,000), the outlet of the metal industries; and *Upsala* (28,000), an old university town.

Mails and Time. Mails are dispatched to Sweden from the United Kingdom twice a day, *via* Holland or Belgium. There are supplementary services *via* Newcastle-on-Tyne and Hull. Stockholm is 1,132 miles from London, and the time of transit is about two days.

Central Europe or Mid-Europe time, that is one hour in advance of Greenwich time, is that which prevails in Sweden.

Position, Area, and Population. The Kingdom of Denmark is one of the smallest, weakest, least fertile, and least populous of European States. It includes the Peninsula of Jutland (including North Slesvig, lately gained from Germany); the islands of Zealand, Falster, Laaland, Langeland, Erøe, Moen, and Samsøe, partly blocking the entrance to the Baltic; Laesøe and Anhøldt in the Kattegat; Bornholm in the Baltic; the Farøe Islands in the North Sea; Iceland (with an independent government, but owning the supremacy of the King) in the Arctic Ocean; and the Arctic island of Greenland. Denmark proper, including the Farøe Islands, has an area of approximately 17,144 square miles and a population of 3,551,000.

Coast Line. The coast line is very long, but there are few good harbours. Unfortunately, the North Sea coast, whose harbours are never frozen, is low, dangerous, bordered by sand ridges and lagoons, subject to fogs, and liable to be flooded by the sea. On the east the openings are deeper, and form good harbours. Copenhagen, Aarhus, and Aalborg are the chief ports. The Great Belt, the Little Belt, and the Sound divide up the country, and the possession of these sea roads to the Baltic is still of great importance, though lessened somewhat by the construction of the Kiel Ship Canal. Vessels of deep draught use the Great Belt; but the Sound, commanded by Copenhagen, is broad and deep enough for all the merchant shipping of the Baltic. The Little Belt is of no importance, commercially or strategically.

Relief. Denmark is the only European country which has no land over 600 ft. high; the highest point, Himmelbjerg, where the Baltic mainland highlands end, is only 560 ft. high. Jutland is, structurally, a continuation of the low North German Plain, and contains large areas of moor and bog, some of which have been reclaimed. The east of the mainland and the islands is somewhat hilly. There are many marshes and small lakes, but there are no rivers of importance, and all are, of necessity, short.

Climate. The climate, generally speaking, partakes of the western (oceanic) and eastern (continental) types of Europe. Long, severe winters are characteristic of the wind-swept Baltic slopes, which are exposed to the full violence of the Siberian winds, when the Baltic entrances are obstructed with ice. Fogs are caused by the meeting of the warm southwest winds with the cold Baltic waters or with the eastern continental winds. The prevailing winds are from the west, and, therefore, moisture-laden; but the absence of mountains as a condensing barrier results in a comparatively small rainfall (similar to that of East Anglia). The fogs, however, are useful in providing moisture and enriching the pasture land. Summer temperatures are higher than those of England, while the winter temperatures are lower. Denmark is naturally a land of heath and moorland, of which much has been transformed into farm or forest land.

Communications. Roads are good for motor traffic, and railways traverse the peninsula from north to south. The "Belts" and the Sound provide good water communication, but interfere with road and rail traffic; a splendid ferry system, however, by which whole trains are carried from island to island, admirably overcomes the difficulty. There

are about 2,700 miles of railway, and Copenhagen is linked by rail and ferry with every other port. Light railways traverse the land, and largely aid the dairy industry. Railways and steam ferries connect Copenhagen by Gjedser with Warnemünde or by Kørsør with Kiel and with Esbjerg.

Productions and Industries. *Agriculture.* Nearly half the people are engaged in agriculture. Denmark leads the world in agriculture, and has shown the way to a higher rural civilization. Its peasantry, the most enlightened in the world, living on small freehold farms, have, for the past sixty years, devoted themselves to the production of agricultural produce on scientific lines; and have built up a large export trade in butter, bacon, and eggs, based on a system of arable dairying. Recognizing that dairy farming produces much more food *pro rata* than meat production, and allows full scope for co-operative business and production, the Danes devote their agriculture to providing food for stock instead of human beings. The yield of crops is very high (wheat, 36.5 bushels; barley, 50 to the acre). Roots, corn, and green fodder for cattle and pigs, are supplemented by foreign corn, bran, and cake. Danish butter is known all over the world for quality and consistency. No butter is exported except from pasteurized cream, and all bacon exported must bear the Government stamp. There are 2,500,000 cattle (half of which are milch), 600,000 horses, 540,000 sheep, 1,500,000 pigs, and 18,000,000 hens.

Manufactures. Manufactures are very limited owing to lack of minerals, especially coal, and the want of water-power. Odense and Copenhagen have woollen factories; Randers has glove factories; and Copenhagen is celebrated for its porcelain. The chief manufactures, however, are closely related to agriculture—beet sugar, margarine, condensed milk, bacon, butter, and leather. Lately, Denmark has specialized in dairy machinery, and the Ford Motor Company has large works in Copenhagen.

Commerce. Most trade is carried on with the United Kingdom, Germany, France, Belgium, Czechoslovakia, Sweden, and the United States. The chief exports are butter, bacon, eggs, cattle, pigs, horses, hams, skins, meat, oil-cake, lard, hides, sheep, tallow, and gloves; and the chief imports are textiles, coal, colonial produce, tobacco, cereals, wine, fruit, tea, flour, and timber.

Trade Centres. The chief towns are: *Copenhagen* (617,000), the capital and chief port; *Aarhus* (81,000), an important port; *Aalborg* (44,000), a canal port and railway centre; and *Esbjerg* (24,000), a rising port.

Colonial Possessions. *Iceland* (30,709 square miles; 109,000 population) is an island, bleak and treeless, in the North Atlantic, just below the Arctic Circle. It is noted for its glaciers and ice-fields, its numerous active volcanoes (Oræfa Jökull and Mount Hekla), its geysers, its high plateaux, and its dreary deserts of rocks. Only about 1,000 square miles of the island are habitable, and fishing, pasturing, and a little mining are the chief occupations of the people. Reykjavik (26,000), on the south coast, is the capital and chief port.

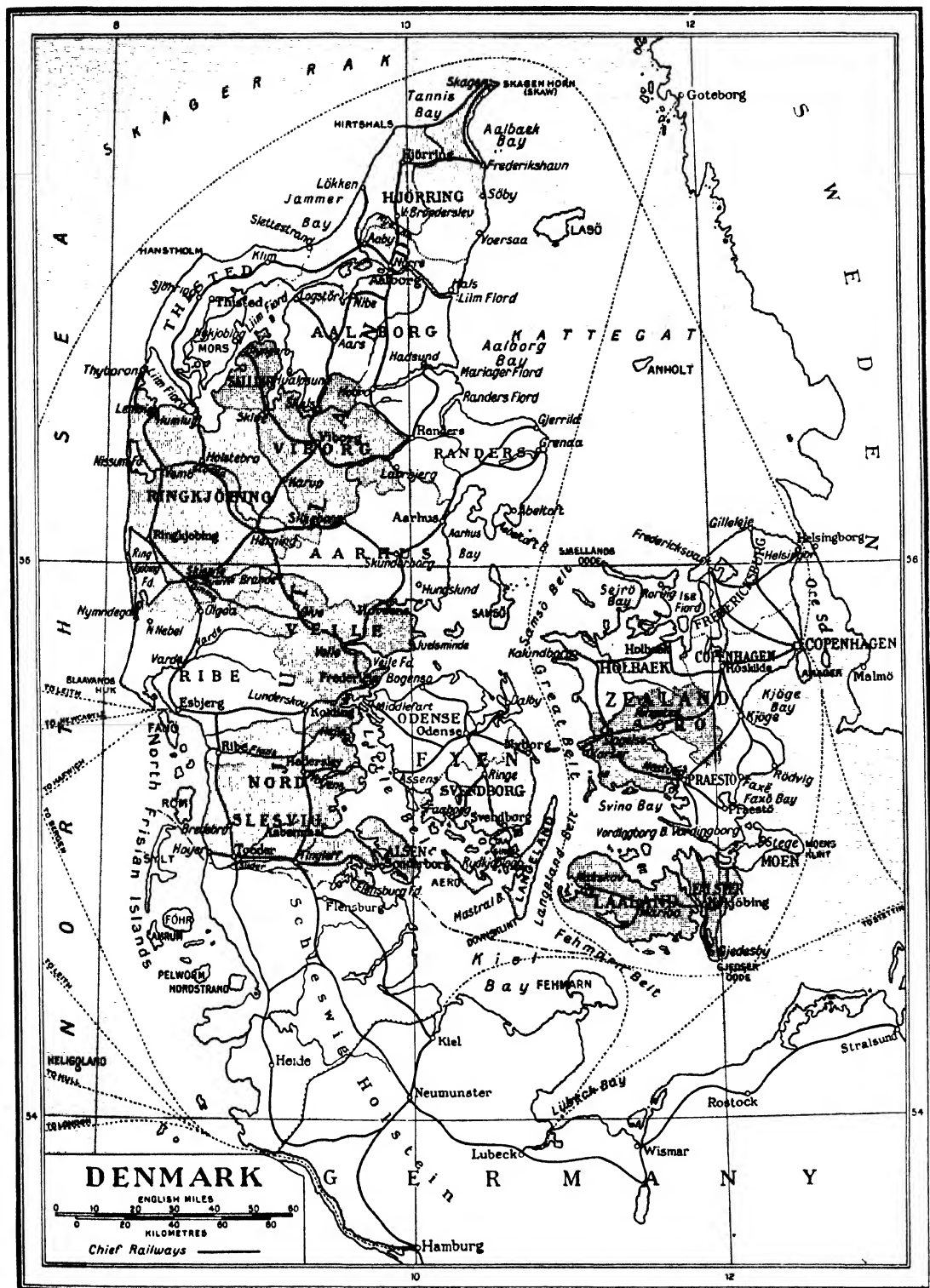
The Faroes (515 square miles; 23,000 population) are a group of twenty-two volcanic islands, lying midway between the Shetlands and Iceland. Sheep rearing, fishing, and sea-fowl hunting occupy the inhabitants. Thorshavn is the capital and chief town.

DENMARK

Greenland, a huge ice-capped Arctic island, has, according to Danish returns, an ice-free area of 46,740 square miles, and a population of 14,500. Hunting, fishing, and mining for cryolite and graphite occupy the inhabitants of the few settlements.

Mails and Time. Mails are dispatched twice a day from London to Denmark. The distance of Copenhagen from London is 728 miles, and the time of transit is about 36 hours.

Mid-European time, that is one hour in advance of Greenwich time, is in use in Denmark.



Position, Area, and Population. The Russian Lands, the second greatest in the world as regards area, stretch from the Baltic Sea to the Pacific Ocean, and from 35° N. Lat. to the Arctic Ocean. They occupy the eastern part of Europe, and the northern and central regions of Asia. The constituents of the Union of Socialist Soviet Republics are: the Russian Socialist Federal Republic (7,626,717 square miles; 105,000,000 population; Moscow, the capital); the White Russia Republic (48,751 square miles; 5,200,000 population; Minsk, the capital); the Ukraine Republic (174,201 square miles; 30,000,000 population; Kharkov, the capital); the Transcaucasian Republic (71,255 square miles; 6,000,000 population; Tiflis, the capital); the Turcoman Republic (189,603 square miles; 1,050,000 population; Poltarask, the capital); the Uzbek Republic (74,786 square miles; 4,500,000 population; Tashkent, the capital); and the Tajikistan Republic (56,608 square miles; 880,000 population; Stalinabad, the capital). Vastness of area, and uniformity of relief, climate, and vegetation have moulded a curious mixture of races into a definite Russian type, which is characterized by humility, a communal spirit, a lack of individuality and initiative, and awaits the awakening that only time, education, and experience will bring.

European Russia (2,000,000 square miles) has a population of over 110,000,000, mostly concentrated in the Ukraine and the central industrial area.

Coast Line. The coast line consists of the shores of five inland seas: the White Sea, the Black Sea, the Sea of Azov, the Caspian Sea, and the Baltic Sea. In sharp contrast with the indented coasts of Western Europe, the Russian coast is unindented, and, in comparison with its area, extremely short. Another great disadvantage is the lack of harbours ice-free all the year round.

Relief. In the main European Russia is a vast undulating plain, stretching 1,700 miles from north to south, and 900 miles from east to west, and never rising above 1,200 ft. Monotony is its keynote. Its highest area is the Valdai Hills (1,150 ft.), the culminating point of the central belt in which the great rivers rise. In the east the Ural block mountains, the largest stretch of highlands (1,600 miles) in Europe, long undisturbed by crustal movements, slope very gradually on the European side, but fall steeply on the Asiatic side. They are widest in the south, where the higher points approach 6,000 ft.; whereas in the centre there is a considerable stretch which does not rise above 1,350 ft. In the Crimea are the folded Yaila Mountains, once continuous with the Balkan Mountains. Russia is well provided with rivers, forming a closely-woven network which covers the whole country. They are tortuous, sluggish, sometimes impeded by rapids and falls, navigable often from their sources, subject to yearly floods and varying depths of water, easily connected by canals, and frozen during the greater part of the year. To the Baltic flow the Neva, Western Dvina, and Niemen; to the Black Sea and the Sea of Ozov the Dniester, Bug, Dnieper (1,330 miles), and Don; to the Caspian the Volga (2,300 miles) and Ural (1,100 miles); and to the Arctic Ocean the Petchora, Northern Dvina, and Onega. The Caspian Sea, the largest salt-water lake in the world (170,000 square miles), was formerly connected with the Black Sea by the Manych depression. Its retreating waters

have left a desolate plain, which is below sea-level and dotted with shallow salt lakes.

Climate and Vegetation. The climate is uniform, continental, and monotonous. Only the southern shore of the Crimea is influenced by the sea, and here the climate is milder than the Riviera. Elsewhere neither height of land nor seaboard influences the climate, with the result that the average annual temperature scarcely varies 20° F. between the extreme north and the extreme south. The annual isothermal lines run, as a rule, from the north-west to the south-east, so that Leningrad, Moscow, Samara, and Orenburg all have the same mean annual temperature of 39.2° F. Eastwards, the average annual temperature rapidly declines, and this is caused by the severity of the Russian winter. Generally speaking, the climate is one of great extremes of heat in summer and cold in winter. Temperatures are occasionally recorded as high as 109° F., and as low as -54° F.; while most places have an extreme range of from 130° F. to 140° F., and record their minimum in January. From the beginning of October to the end of April, terrific storms sweep the country, and cover tundra, forest, and steppe with endless leagues of snow. Only in the most southern and south-eastern regions of Russia does the number of days with a temperature below freezing point fall below 100. The rainfall is everywhere rather low. In North-east Russia the rainfall and snowfall combined are about 20 in.; in Central Russia above 20 in.; in the steppes well under 20 in.; while the Caspian depression is the driest region in Europe.

European Russia divides into seven natural regions. The Arctic Tundra, lying north of 65° N. Lat., has a sparse vegetation of lichens, mosses, stunted bushes, and low berry-bearing bushes. The Coniferous Forest Region, lying to the south of the tundra and stretching from the Onega River to the Urals, has, as its chief trees, the Norway spruce, the European larch, the Scots pine, the Siberian spruce and fir, and the white birch. The Deciduous Forest Region, lying to the south of the Coniferous, includes the greater part of Central Russia. Its chief trees are the oak, maple, elm, ash, and alder. The Black Earth Region, stretching from the Ukraine to the Middle Volga, is a rich grassland, specially adapted to wheat growing. The Steppes Region of the south-east is mainly a pastoral area, a measureless sea of grasses in spring, a canopy of snow in winter. The Ural-Caspian Steppes Region is the barest region of European Russia. The "Mediterranean" Region includes the Crimea and the shores of the Black Sea.

Productions and Industries. Though far behind the Western countries in actual development, Russia's possibilities are second only to those of America. Before the Great War Russia was second in the world production of wheat, first in manganese, timber, and flax, and fifth in cotton. Vast areas of land are suitable for the large-scale production of raw materials and foodstuffs; the Donetz coal-field is one of the largest in Europe, and the largest coal-field in the world is in Siberia; the iron of the Kursk province is estimated to be more than six times that of Lorraine; and the oil resources of the Caspian area are immense. Russia has been hindered greatly by its past inefficiency and by wars, revolutions, famines, and blockades, so that its recovery

RUSSIA with the BALTIC AND CAUCASIAN STATES

0 100 200 300
ENGLISH MILES
0 100 200 300 400
KILOMETRES

Railways

Steamship Routes ---



is bound to be slow. Its poor transport facilities, its need of technical equipment, organization, and education, and the suspicion with which its present Government is regarded by financial centres, prevent it taking the place in world commerce that its great resources warrant.

Agriculture. Russia is essentially an agricultural country, but farming is in a backward state owing to the antiquated methods in the past, the harsh climatic conditions, and the poverty and ignorance of the peasants. To increase production the State has established giant farms, which use the most up-to-date agricultural machinery. Cultivation is carried on from the Black Sea to beyond 60° N. Lat.; in the more northerly tracts, crops are grown in the forest clearings. Barley and oats appear in the southern part of Archangel and Vologda, and winter rye is also produced in the same regions. Wheat, mainly spring wheat, extends in a belt north of the pastoral steppes of the Black Sea; the climatic and soil conditions are excellent for the growth of high-grade wheats, but the yield per acre is a low one. Maize is grown in the warm south. Barley has a wide range, being found in the north, centre, and south. Flax is largely cultivated, both in the north and south. Hemp is grown in the forest clearings of the west, while rye is grown in almost all districts but the salt steppes. Sugar-beet is raised in large quantities in the Dnieper and Dniester valleys, and tobacco is also produced in the same regions. Potatoes are largely grown in the north-west. The vine and Mediterranean fruits are produced in the "Mediterranean" area. The acreage and production of crops are (figures in million acres and tons, 1930): wheat (68; 23), rye (64; 20), oats (25; 16), barley (18; 5.5), millet (13; 3.0), maize (11; 3.4), buckwheat (6.5; 1.7), other grains (5; 1.9), flax (4; 0.4), hemp (2.3; 0.5), sunflowers (8.2; 2.15), sugar-beet (1.8; 9.7), and cotton (Central Asia, 2.2; 1.0).

The Pastoral Industry. In the south-east the life of the people is still partly pastoral and nomadic. Millions of sheep are reared on the steppes, and cattle, goats, and horses are also fed in large numbers. Cattle are important all over the country. Pigs roam in the oak and beech forests. Dairying and poultry-keeping are important in the north-west and in the Ukraine. Russia possesses a very large number of live stock (figures in millions: horses, 32.8; cattle, 69.4; sheep and goats, 141; pigs, 25.6; and camels, 0.8), ranking next to the United States with regard to domestic animals.

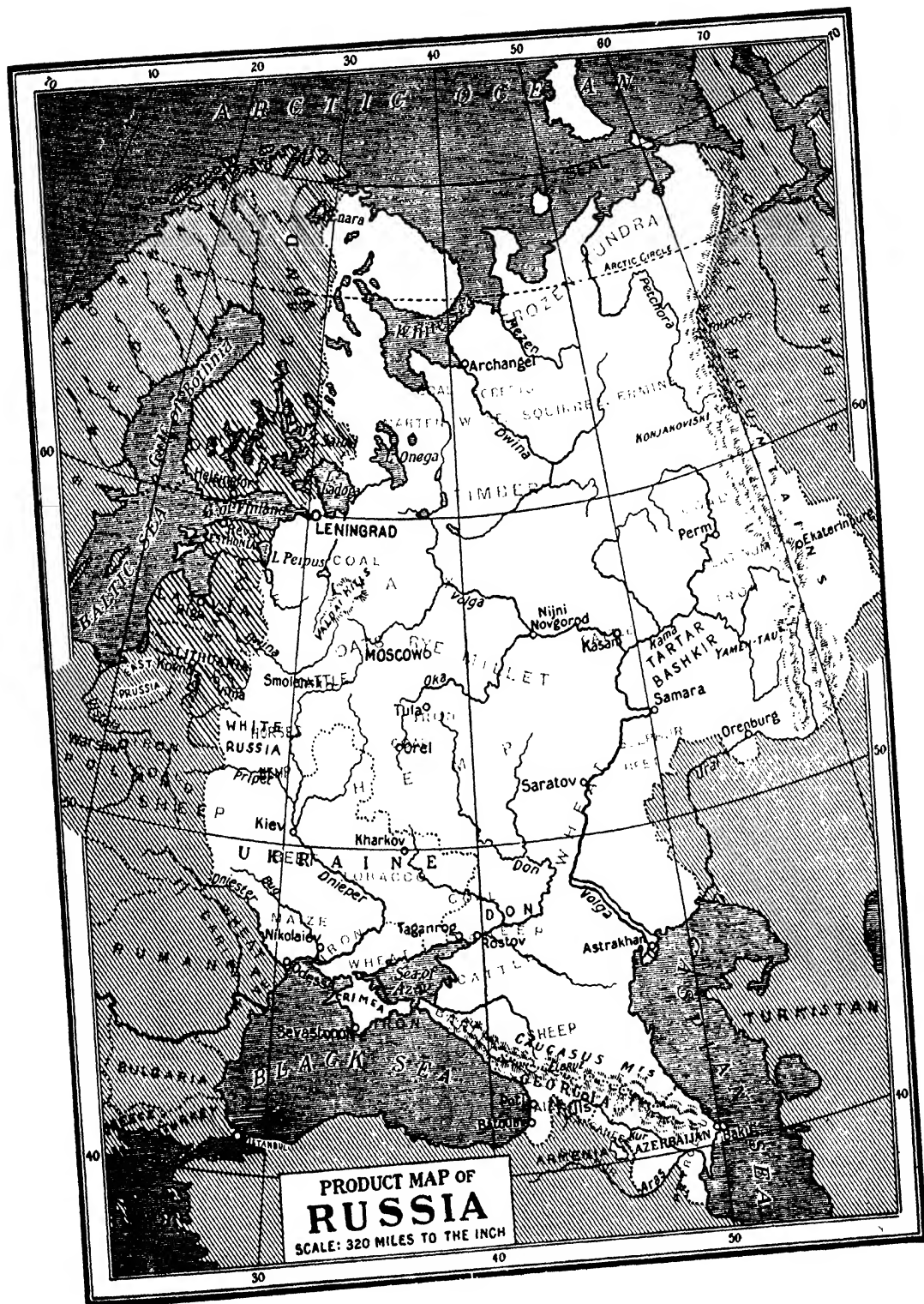
Forestry. Next in importance to agriculture come the immense timber reserves of Russia, which may be said to represent an untold source of wealth, the magnitude of which will only be realized when an adequate system of transport enables them to be worked in a businesslike manner. Forests occupy two-fifths of the whole country. The pine, spruce, and larch are obtained from the coniferous forests, and oak, ash, beech, and lime from the deciduous forests. Timber is used for building material (except in the steppes, where bricks are used), as Russia is very deficient in stone; it yields charcoal fuel for domestic and industrial purposes, and is normally the second export after grain and flour. Pitch, tar, and turpentine are obtained from the pine; the silver birch and other barks support a tanning industry, and wood-pulp is produced in large quantities. The fur-bearing animals of the forests supply very valu-

able furs and skins. Leningrad, Kronstadt, and Archangel are the chief timber ports.

Fishing. The river fisheries (especially the Volga) and those of the Caspian Sea are very productive. Sturgeon, carp, pike, roach, trout, bream, lamprey, starlet, and tench are the chief fish caught, and the preparation of caviare (largely exported) forms an important part of the fishing industry of Astrakhan and the Caspian. Seal fishing is carried on in the Arctic Ocean and the Caspian Sea, and the herring fisheries of the northern seas are important.

Mining. In the Urals every known mineral is said to be found. Coal (annual production, 50,000,000 tons) is found in the Urals, east of Perm, where it is used for smelting ores; in the region south and south-west of Moscow, chiefly the Oka Valley, with Tula as a centre, where it is used in the textile and iron factories; and in the Donetz Valley, the most important of all, where it is used for smelting iron. In Siberia the Kusnetsk Basin is estimated to contain 388,000 million metric tons of coal, and other rich coal areas are in the Cherkassk and Menzinsk Basins. Russia is particularly well provided with iron. There are extensive untouched iron deposits in the Kusnetsk Basin, and the Kursk province (250 miles south of Moscow) has one of the richest iron areas in Europe. The rich deposits of iron ore in South Russia, in the Urals, in Central Russia, and in the Kirghiz steppes (total annual production, 10,000,000 tons) render the future of the iron and steel industry very promising. The high quality of the famous Krivoi Rog, with a content of iron of 62 per cent, is well known. The gold ores of the Urals supply a large quantity of the wolframite, osmium, tantalum, and iridium used in the manufacture of electric lamps. From this region, also, are obtained precious stones (emeralds, sapphires, topazes, amethysts, tourmalines), and much of the malachite and lapis lazuli which are worked up into objects of art. Platinum mines between Ekaterinburg and Perm produce the bulk of the world's supply. No other country in the world has such a wealth of manganese as Russia (annual production, 740,000 tons). There are two great manganese districts, Chaitouri, the richest, and Nikopol. Copper (annual production, 647,000 tons; estimated total available, 100 million metric tons) is found in the Urals, the Kirghiz Steppes, and Siberia. Salt is obtained in the Caspian Depression; in the Crimea chiefly from brine lakes, and in the centre and north from rock-salt. Mercury is found in the Veronezh district, and marble in the Crimea. On the flanks of the Caucasus are the principal oil-wells (annual production of petroleum, 17 million tons) at Baku, Grozny, Maikop, and, to the north of the Caspian, Emba. The oil is carried by trains and pipes to Batum and Poti, and by tank steamers to Astrakhan and the Volga.

Manufactures. Though Russia will have to rely on extractive industries for some years to come, yet its manufactures are developing rapidly. Cheap labour, abundant mineral wealth, and large supplies of raw materials, backed by a future well-organized railway system, should give Russia a foremost place in manufactures. Huge power plants and modern factories have been set up by the State, and the number steadily increases. In Southern Russia the iron and steel industry is important: Krivoi Rog, Mariopol, Berdiansk, and Yuzovka are the chief



centres. The Don Valley has huge ironworks at Tula, and at Briansk there is an ordnance factory. Rostov has a monster factory for the manufacture of agricultural machinery, Magnëtogorsk the largest steel plant in Europe, and Nijni Novgorod has great motor-car works. Other centres are Zlatoust, Tagilsk, Ekaterinburg, and Perm. The major industries are combined in syndicates of federal scope for development and marketing. Machinery has been purchased; foreign organizers have been engaged; and efforts are being made to create an industrial population in record time from unskilled labour. Hand labour is being largely displaced by factory labour in the textile industries. Cotton, wool, flax, and hemp are the chief textiles, and Leningrad, Moscow, Vladimir, Tver, Smolensk, Kaluga, Kostroma, Yaroslav, Narva, Tula, Kiazan, and Pskov are the chief centres. In the beet-growing districts, especially around Kiev, the sugar industry employs many people. Tobacco is prepared at Samara and Saratov. Moscow and Leningrad have varied manufactures, and Stalingrad has a great tractor factory.

Communications. The total length of useful inland waterways is about 22,000 miles. Russia is so level that its waterways, although shallow in summer and frozen in winter, provide extensive, cheap navigation. By river and canal, goods may reach the Baltic from the Caspian or the White Sea from the Caspian; and the cutting of an 80-mile canal from the Tsaritsin bend of the Volga to the Don would connect the Caspian with the Black Sea. Unfortunately, the waterways have nowhere a free oceanic outlet, except through the White Sea, which is closed by ice for most of the year. The Volga with its tributaries carries annually about 16,000,000 tons of freight (less than a quarter of that of the Rhine), although it suffers from its direction of flow into the Caspian Sea, its liability to be obstructed by sandbanks, its varying volume, the drying up of its basin, and its closing by ice from 195 to 260 days each year. Sledge traffic takes the place of boat traffic in the winter, the routes following the river courses.

Roads are poor and few in Russia. The absence of road-building material and the shortage of skilled labour are great drawbacks to their construction. There are about 50,000 miles of railway. Construction has been aided by the build of the country, the only disadvantage being the wide rivers, which necessitate long bridges. Moscow is the centre of the railways, and from it lines radiate in all directions, giving connections with Vienna, Berlin, Leningrad, Archangel, Port Arthur, Vladivostok, and the ports of the Caspian, Black, and Baltic seas. Westwards from Moscow a railway runs through Smolensk and Minsk to Warsaw and Berlin, and eastwards a line passes through Penza, Samara, and Ufa. At Samara, Asiatic routes diverge, the Trans-Siberian passing through Ufa and Chelyabinsk, and running eastwards to Vladivostok and Port Arthur; while the line to Russian Turkestan runs south-eastwards to Orenburg. Southwards from Moscow, lines proceed to Kherson, passing through Tula, Orel, and Kharkhov, to the mining and manufacturing region round Tula and Kiev, and to Odessa and Rostov and on to Baku, from whence another railway, utilizing the Suram Pass, reaches Poti and Batum. North-westwards a line passes

through Tver to Leningrad, connecting with the line to Berlin, *via* Vilna and Königsberg, and northwards a line runs through Vologda to Archangel. The mining region of the Urals is served by lines from Tiumen to Ekaterinburg, and from Kotlas through Viatka, Perm, and Ekaterinburg to Chelyabinsk. Odessa is connected with Berlin by a line *via* Lwów; and Leningrad is connected with Murmansk and Alexandrovsk, practically ice-free ports in the north of the Kola peninsula.

Commerce. Russia's inland trade is more important than its external trade. At the great fairs, notably that of Nijni Novgorod, much trade is done. Among the goods brought to the fairs are raw cotton from Turkmenistan and Uzbekistan; hair, skins, and hides from the Steppes; furs and gems from the Urals and the north; rice, sugar, coffee, and tea from Asiatic countries, and manufactured goods from the south and centre. The chief exports are corn and flour (especially wheat), butter, eggs, timber, wooden goods, flax, furs, leather, petroleum, manganese ore, fish products, hemp, linseed, platinum, horses, cattle, wool tobacco, and meat; and the chief imports are raw cotton, metals, coal and coke, metal goods and machinery, tea, coffee, rice, fruits, wine, and textiles.

Trade Centres. Large towns are few and widely scattered. The chief are: *Moscow* (2,400,000), the capital and chief commercial and industrial centre; *Leningrad* (1,620,000), the former capital, and one of the most important ports; *Rostov* (308,000), a great distributing centre; *Saratov* (215,000), the centre of the Black Earth Region; *Nijni Novgorod* (185,000), a great fair centre; *Kazan* (179,000), a distributing centre; *Astrakhan* (177,000), the chief trade centre of the Caspian; *Samara* (176,000), an important grain centre; *Orel* (162,000) and *Tula* (153,000), iron and steel centres; *Stalingrad* (148,000), *Orenburg* (123,000), a railway centre; and *Archangel* (70,000), Russia's oldest seaport.

There are two mail services daily between Great Britain and European Russia. The time of transit to Leningrad (1,710 miles from London) is slightly over 2½ days, and to Moscow a day longer.

Eastern European time, two hours in advance of Greenwich time, is in use in Russia in Europe.

White Russia (48,751 square miles; 5,200,000 population) is largely the lowland of the Upper Dnieper basin. Much of it is swampy and infertile, containing the Rokitno marshes, still largely undrained. Agriculture and forestry are the chief occupations. *Minsk* (137,000) is the capital.

Ukraine (174,201 square miles; 30,000,000 population) is populated mainly by Little Russians, who are individualists rather than communists. The whole of the region is a boundless plain, with a continental climate. In the north there are forests and marshes, but much of the region is covered with fertile black earth (*chernozom*). Agriculture is the leading industry, and wheat, rye, oats, barley, and maize are the chief crops. Flax, hemp, tobacco (round Kiev), beet, wine, potatoes, fruit, sunflowers, and honey are other agricultural products. The steppe region of the south is pastoral, and hides, skins, hair, bristles, and wool form important exports. Poultry farming is increasing in the grain lands, and dairying, cattle breeding, and sheep-rearing are growing in importance. The eastern area is rich in coal and iron, the Donetsk coal-field

normally producing 28,000,000 tons annually, and Krivoi Rog leading all Russian iron districts in its output of iron. Quicksilver and salt are the other mineral wealth. Manufactures are developing. Milling, brewing, distilling, and sugar refining are carried on in most of the towns. Kharkhov and Poltava manufacture woollen goods; Kiev and Kharkhov have sugar refineries and flour-mills; Kiev and Kherson make leather, soap, and candles; Krivoi Rog and Kiev have iron and steel works; and Odessa, Nikolaiev, and Kherson have shipbuilding yards. *Kharkhov* (729,000), the capital; *Kiev* (514,000), a holy city and great route centre; *Odessa* (421,000), the chief port; and *Nikolaiev* (105,000), a flour-milling centre and port; are the chief towns.

Transcaucasia (71,255 square miles; 6,000,000 population) includes Azerbaijan, Armenia, and Georgia. *Azerbaijan* occupies the lowlands of the river basins of the Kur and the Aras. It has a coast line to the Caspian exceeding 400 miles, and stands athwart the main line of communication between the Black Sea and Central Asia. The chief industry is the production, refining, and exportation of oil and petroleum. Agriculture occupies many of the people, but some still lead a nomadic pastoral life. *Armenia* is a continuation westwards of the great Iranian plateau. It is an exceedingly mountainous land, difficult of access, and inhabited by primitive farmers with starveling flocks and inadequate harvests. Grain, tobacco, cotton, grapes, sesame, flax, figs, pomegranates, and oranges are grown in sheltered valleys, and cereals, hemp, and hardy fruits on the higher ground. The uplands afford pasture land for horses, mules, sheep, and goats, and from the earliest times have supported the flocks of the Kurds. Mineral wealth, though great, is not exploited. Erivan (75,000) is the capital. *Georgia* has the Caucasus in the north and Armenia in the south. The Caucasus Mountains belong to the Alpine-Himalayan young folded mountain system. Throughout their whole course of about 900 miles from Novo Rossisk to Baku they maintain an elevation of about 10,000 ft., with very few breaks, and run direct from south-east to north-west with only the smallest deviation. Almost exactly halfway between the two seas the range is divided into two unequal parts by a depression, through which the great military road, the Dariel Pass or Georgian Road, passes from Vladikavkas to Tiflis. The western Caucasus contains the highest summits: Elbruz (an ancient volcano, 18,526 ft.), Koshtantau, and Dikhtau. Rising ground near Gori forms the watershed, which divides the Rion running into the Black Sea westward, and the Kur (830 miles) running eastward into the Caspian. Agriculture is the leading industry, the chief crops being maize, fruits (apples, pears, peaches, apricots, almonds, oranges, lemons), grapes (32,000,000 gallons of wine annually), tea, mulberries (silk production important), barley, wheat, cotton, rice, liquorice, and tobacco. Cattle and sheep number 12,000,000 head, and cheese, wool, hides, and skins are exported. Manganese ore is the chief mineral wealth. It abounds round the ancient city of Kutais. Tiflis (294,000), the capital; Baku (453,000). Batum (60,000), thriving oil ports; and Poti (30,000), a port, are the chief towns.

Russian Turkestan is perhaps the most convenient

title under which to group the Turkmanistan (189,603 square miles; 1,050,000 population), Uzbekistan (74,786 square miles; 4,500,000 population), and Tajikistan (56,608 square miles; 850,000 population) Republics. Turkestan is the bed of a dried-up sea, a vestige of which remains as the Aral. Much of it lies below 600 ft., and some of it round the Caspian border is actually below sea-level. In the south rises the abrupt buttress of the Iran Plateau, and eastwards tower the masses of the Pamir and Thian-shan. The drainage is internal and mainly to the Sea of Aral, a brackish lake almost the size of Scotland. The Amu-Daria (Oxus) and the Syr Daria (Jaxartes), fed by the glaciers of the lofty mountains in the south and east, flow to the Aral Sea. The Ili enters Lake Balkhash through a swampy delta, but the Zarafshan, Tejend, Murghab, and the Heri-Rud dry up in the sands.

The climate is of the extreme dry type, and characterized by great extremes—intense heat in summer and intense cold in winter. Irrigation is everywhere necessary, and were it not for its bordering mountains, the country would be uninhabitable. Away from the rivers there are deserts—the Karakum, west of the Amu-Daria; Kizil-kum, between the Amur and the Syr; and Ak-kum, between the Syr and Lake Balkhash. Vast areas are left entirely lifeless and plantless. They are impassable stretches of moving, heaving sands, vegetation gaining a foothold only in the relatively settled areas. Agriculture is generally dependent on the rivers. It is carried on in a manner quite archaic; tools and implements are of the most primitive character; but the art of irrigation is thoroughly understood and practised. The oases of Ferghana, Tashkent, Samarkand, Bokhara, Khiva, Merv, and Murghab produce fine "Upland" cotton, wheat, barley, rice, maize, silk, Mediterranean fruits (especially stone varieties), wine, flax, tobacco, and hemp. Unlike its European rivals, Russia can produce much of the cotton that it needs. The winter and spring rains provide temporary grazing grounds for cattle, fat-tailed sheep, ponies, camels, horses, yaks, and goats, which migrate in summer to the snow-free and luscious mountain pastures. Astrakhan and caracul are derived from the curly wool of the Karakul sheep. Hides, hair, wool, leather, carpets, and rugs are important products. The mountains are rich in minerals, and petroleum abounds near the Caspian, furnishing fuel for the Transcaspien locomotives. Iron, copper (Kounrad), and lead are mined.

Apart from the Transcaspien Railway and the Tashkent-Orenburg Railway, communications are entirely by camel caravan. *Pollarask* (52,000), the capital of the Turkmanistan Republic; *Samarkand* (105,000), an ancient city of *Uzbekistan*; *Tashkent* (402,000), the capital and finest commercial centre of Uzbekistan; and *Bokhara* (75,000), a fruit and cotton centre, are the chief towns.

SIBERIA

Position, Area, and Population. Siberia is bounded on the west by the Ural Mountains, the Ural province, and Turkestan; on the south by Mongolia and Manchuria; on the east by the Sea of Japan, and the Okhotsk and Bering Seas; and on the north by the Arctic Ocean. Its area is approximately 5,250,000 square miles, but its population approaches

only 11,000,000, and is largely composed of exiles or descendants of exiles who were sent from Russia for political or criminal offences, and native tribes of Mongolian origin. Even in the most favoured agricultural regions of Tomsk the density of population ranges only between ten and twenty to the square mile.

Coast Line. The northern Arctic coast is low, flat, and dreary. Fiords penetrate the land, and islands fringe the coast where the Obi and Yenisei estuaries open to the Arctic. Farther east, the rivers form great deltas at their mouths. Trade is small on this coast; only a few ships reach the Yenisei during the few weeks when the Arctic ice is broken up. On the north-east the coast approaches the American coast, the shallow Bering Strait being only 36 miles across at one point. Islands fringe the irregular, steep, and rocky coast of the Pacific. No harbour on this coast is ice-free all the year round; even the fine harbour of Vladivostok is not completely so.

Relief. Siberia, part of the old land-block of Angaraland, consists mainly of a vast plain of low average height, which is a continuation of the Great Northern Plain of Europe, and is remarkable for its desolate uniformity and the striking contrasts in physical conformation. Snowclad mountain ranges of grandeur unsurpassed, rising to almost Alpine altitudes, are almost contiguous with wide expanses of monotonous, level tableland. On the south and east, the Central Asian Plateau and Highlands bound the plain; the chief ranges are the Altai, Yablonoi, and Stanovoi. Lake Baikal (12,441 square miles), drained by the Angara River, occupies a great rift valley, shut in by mountains rich in metals, and has hot springs on its eastern shores. Several of the longest rivers in the world intersect Siberia from east to west, and from south to north. The main river is the Lena (2,860 miles), rising almost at the edge of Lake Baikal, and running northwards to the Arctic. The Amur and its tributary, the Amgun (2,720 miles), empties into the Okhotsk Sea, and the Obi (2,100 miles), the Irtysh (2,300 miles), and the Yenisei (3,000 miles), drain to the Arctic. In many ways these rivers are Siberia's most valuable asset. They are an almost inexhaustible source of food (the sturgeon and starlet are the chief fish), and they are the main highways north and south, and even in some cases east and west. Though icebound for many months in the year, and sometimes impeded by bars at their mouths, they present immense possibilities for inland navigation during the summer months, but generally they are deserted. Steady summer traffic by river and sea from Central Siberia through the Kara Sea to Europe has, however, been accomplished, and the heart of Siberia is now in direct touch with ships from London and Stockholm.

Climate and Vegetation. The climate is everywhere of the continental type. In the west, the mean winter temperature is 1.4°F. , the mean summer temperature 63.5°F. , and the annual rainfall 15 in. Middle Siberia has an average winter temperature of 0.4°F. , an average summer temperature of 61.9°F. , and an annual rainfall of 14 in. In the Yakutsk Territory the average winter temperature of the south is -27.4°F. , and of the north -52.6°F. From north to south, Siberia falls naturally into three climatic and soil zones: (1) the monotonous tundra region of the north, stretching

from the Arctic to about 63°N. Lat. , frozen marsh-land where the soil never thaws, even in the height of summer, more than 18 in. below the surface, where nothing grows except summer flowering weeds, mosses, lichens, and low shrubs, and the only animal that flourishes is the reindeer; (2) the *taiga* or forest region (largely coniferous—fir in the north; birch and pine in the south; cedar, oak, ash, cork, acacia, and walnut in Amuria), the world's greatest reserve timber resource, stretching from the Urals to Kamchatka and approximately between 56° and 63°N. Lat. ; and (3) the steppe and agricultural region, mainly between 50° and 56°N. Lat. , but in parts extending up to 60°N. Lat.

Productions and Industries. *Agriculture.* Siberia is the land of the future, a land of undeveloped wealth, due to lack of transport, distance from buyers, its geographical position, its severe cold, and its lack of enlightened government. Its great riches are potential rather than actual, but there can be no doubt of its great future. Agriculture is the principal occupation, and will develop greatly when the Trans-Siberian Railway is provided with branch lines and immigration increases. In normal years the annual immigration is 700,000 and 4,000,000 acres of new land are brought under cultivation. Hardy and drought-resisting cereals promise an important future granary of the world. The systems of agriculture vary, but may be classed generally as very primitive. Wheat is the main crop, but barley, oats, rye, and potatoes are also important. Little more than half a century ago Siberia was scarcely more than a penal settlement; now the agricultural steppe lands have been taken up, so that the present immigrants have to make extensive clearings in the forests. One of the most fertile parts of Siberia lies south of the Trans-Siberian Railway from the Obi to the Yenisei, extending almost to Semipalatinsk. It is said that this district could produce sufficient wheat to feed 600,000,000 people.

The Pastoral Industry. Sheep, cattle, and horses are reared in great numbers. The cattle industry is important in various parts of Western and Middle Siberia, and in the moist Amur-Ussuri valleys the rich pastures and prolific crops of soya bean lead to cattle-rearing for meat. The Trans-Siberian Railway, by opening markets to Siberian produce, has stimulated the dairy industry and exports of butter. There are central creameries and butter factories at Omsk, Kurgan, Tomsk, Kainsk, Barnaul, and Semipalatinsk. On the poor steppes the nomadic herdsmen of Tatar race possess valuable herds of cattle, droves of horses, camels and asses, and flocks of sheep. Hides and skins, live and dead meat, and butter are characteristic products. The reindeer supplies the nomadic pastoral Samoyedes and Ostyaks of the tundra with meat, milk, leather, clothing, and transport.

Hunting and Fishing. Numerous fur-bearing animals—the sable, fox, marten, squirrel, beaver, and ermine—are hunted in the forests, and Tobolsk, Turukhansk, Irbit, and Tiumen are fur-trading centres. Fisheries, especially of salmon, in the far eastern lands are of growing importance, and salmon-canning employs many hands, especially at Nikolaievsk on the Amur.

Forestry. There is an inexhaustible supply of timber, but many of the great forests are still

inaccessible, and the science of forestry is not understood. Conifers abound, and birch, aspen, alder, and poplar are chief among the deciduous trees. The paper-pulp industry is in its infancy.

Mining. Siberia possesses vast mineral wealth, which has been little prospected and less worked. The known coal resources of its fields, like those of Kuznetsk and the Maritime Province, are sufficient to warm the whole world for tens of centuries to come; its gold-fields long since gave it the name of the "land of gold," and are supposed to cover over 800,000 square miles (early in this century they were yielding 1,500,000 oz. annually); its oil-fields are very extensive, though at present unprofitable to develop; and there are huge supplies of copper, silver, graphite, zinc, and lead. Most of the mineral wealth lies in the east. The main coal-fields are in the Kuznetsk basin south of Tomsk; at Cheremkhovskoe, 70 miles west of Irkutsk; to the north of the Altai Mountains (Transbaikalia); in the Maritime Province and Sakhalin (especially at Suchan near Vladivostok); and on the Kirghiz Steppe. Owing to the backward manufacturing conditions and cost of transport, there has been little to encourage coal-mining on a large scale. Gold is found in the Lena, Amur, Vitimsk, and Yeneseisk fields. The metal is obtained by washing gold-bearing gravel, and the frozen gold-bearing earth has frequently to be thawed by fires placed upon it. Copper is mined near Akmolinsk on the steppes, and treated at the great Spassky smelteries; silver is mined near Semipalatinsk, and petroleum is obtained at Emba-Uralsk, to the north-east of the Caspian Sea. Important mineral regions are: the Altai Mountains, rich in gold, silver, lead, precious stones, copper, and zinc; the Sayansk Highlands rich in silver, lead, graphite (from the famous Alibert mine), nitre, and precious stones; the Amur Highlands, yielding silver, iron, copper, lead, gold, and quicksilver (Nerchinsk); and the extreme north-eastern highlands.

Manufactures. Manufactures are few, and are represented by creameries, butter factories, flour-mills, distilleries, breweries, tanneries, saw-mills, and pulp-making mills.

Communications and Commerce. In many parts of Siberia the *tarantass* (a four-wheeled springless cart) in summer and a sleigh in winter are still the sole means of land transport. There are 85,000 miles of waterway, of which 20,000 are navigable during the summer. An almost uninterrupted waterway is available in the summer from the Urals to the Pacific, and a canal connecting the Obi and the Yenisei helps to complete the waterway between Lake Baikal and the Urals. From east to west, Siberia is traversed by the great transcontinental Trans-Siberian Railway, previously described.

The trade of Siberia with western countries passes through European Russia; and that with China is overland, and tea is an important product. Vladivostok is the chief port for the Pacific trade. The chief products carried on the Trans-Siberian Railway westwards are wheat, meat, butter, hides, tallow, tar, pitch, metals, eggs, game, tea, silk, and furs. Eastwards, iron and ironware, cottons and woollens, sugar, petroleum, and machinery are the chief commodities conveyed. Leningrad and Archangel are the chief European outlets.

Trade Centres. The chief towns are: *Irkutsk*

(100,000), the capital of Eastern Siberia, and an important railway centre; *Tomsk* (92,000), the chief depot for Altai products; *Vladivostok* (108,000) the largest trading port and chief naval base on the Pacific; *Omsk* (162,000), steppe market and dairying centre; *Novo Nikolaievsk* (100,000), the capital of West Siberia; *Kiahhta*, a caravan centre; *Yakutsk* a great fur centre; *Tiumen*, a railway and fair centre, and Port Igarka, Yenisei port.

FINLAND

Description. Finland (132,589 square miles; 3,655,000 population) is a republic, lying north of the Gulf of Finland and east of the Gulf of Bothnia. Structurally, the country is a low, undulating, granitic, and crystalline plateau (average height above 500 ft.), a relic of the ancient continent of Arctis, reaching heights of 3,000 ft. to 4,000 ft. only in the northern Lapland areas, and showing in its glacier mantle (geologically but of yesterday), innumerable lakes and swamps, areas of bare rock, and rivers impeded by waterfalls and rapids, the effects of successive Ice Ages. The climate is a modified continental of long and severe winters and warm summers. From November to April the ground is frozen and snow-covered, and the lakes, marshes, rivers, and bordering gulfs are ice-bound for most of this period. The mean annual temperature is 37° F., and the mean annual rainfall 25 in. Spring is a season of enchantment, the prelude to a short, hot summer, which puts a premium on quick vegetable growth. Tundra conditions prevail in the north; elsewhere (apart from the lakes and swamps which make up about one-third of the area) the land is a natural forest, chiefly coniferous (Scots pine, spruce, fir, and larch), deciduous types (birch, aspen, and alder) appearing in the south-west. Pasture and arable land find place in the forest clearings.

Productions and Industries. The principal natural resources of Finland are timber and agricultural and pastoral products. These and the industries arising from them, are most carefully organized on co-operative principles, and fostered by the Government. Abundant wood, facilities for floating it, and plentiful water-power make the timber industry with its subsidiaries, wood-pulp, paper, resin, tar, and turpentine, the most important. Finnish timber is a serious competitor of the Swedish. Only about 6 per cent of the land is under cultivation. The chief crops are rye, oats, potatoes, and hay. A small acreage is under barley, but wheat is not grown. Dairy produce—butter, cheese, and eggs (1,250,000 poultry)—is becoming increasingly important as an export. A large number of live stock are bred (425,000 horses; 1,800,000 horned cattle; 490,000 sheep; and 380,000 pigs). Iron is found in the south, but coal is absent, and the unfavourable geological formation of the country precludes hope of mining becoming important. The utilization of water-power (estimated 3,000,000 h.p.), both directly and electrically transmitted, has given rise to important industries. Abö (Turku) and Helsingfors (Helsinki) have ironworks; and textiles (chiefly cotton) are manufactured at Tammerfors (Tampere), Björneborg (Pori), and Vasa (Vaasa). Cellulose, paper pulp, and paper are produced in most of the towns.

Communications and Commerce. Finland is not a country of easy communications. Both roads and railways have to wind among the innumerable lakes. Good roads are scarce, except in the principal towns. The country is abundantly supplied with means of water transport, and vast quantities of timber are moved to the ports by water. Canals connect the lakes with each other and with the Gulf of Finland, and important traffic is carried on these waterways in summer. The railways (2,800 miles) are State-owned and efficiently worked. Railway connection with Sweden was completed in 1919. From Helsingfors, Abö, and Viborg (Viipuri) steamship connection is kept with the outside world, ice-breakers being used in winter. Most trade is carried on with the Baltic countries, the countries of North-West Europe, the United Kingdom, the United States, Brazil, and Argentina. The chief exports are timber, paper, cardboard, gums, resins, tar, granite, leather, hides, dairy produce, fish, explosives, matches, and some iron and textile manufactures; and the chief imports are cereals, colonial produce, coal, coke, spices, cotton and woollen goods, leather, hides, metals, machinery, oils, and fats.

Trade Centres. The chief towns are: *Helsingfors* (241,000), the capital and chief port; *Abö* (66,000), the former capital and a textile centre; *Tammerfors* (56,000), a textile centre; and *Viborg* (56,000), the second port.

Mails reach Finland in three or four days.

Esthonia. The Republic of Esthonia (18,353 square miles; 1,117,000 population) lies on the East Baltic, on the south shore of the Gulf of Finland. Lowlands and low morainic heights, and glaciated hollows filled with lakes, make up its surface. Its climate is of the continental type, characterized by cool, short, bright summers, long, severe winters, and most rain in summer. The region is naturally a forest area, mainly coniferous; but pasture and arable lands now find a place in the forest clearings. Rye, oats, barley, flax, hemp, potatoes, and beetroot are cultivated; and dairy-farming, bee-keeping, rabbit rearing, and poultry production engage many of the smallholders. The forests yield useful timber and wood-pulp. Matches and paper are made at Reval; furniture at Dorpat; and cotton textile at Narva. The chief exports are flax, timber, wood-

pulp, cellulose, cement, turpentine, resin, hemp, and eggs; and the chief imports are salt, coal, sugar, iron and steel goods, agricultural machinery, and textiles. *Reval* (132,000), the capital and chief port; *Dorpat* (70,000), noted for its university; and *Pernau* (25,000), a port, are the chief towns.

Latvia. The Republic of Latvia (24,400 square miles; 1,900,000 population) lies at the eastern and southern shores of the Gulf of Riga. Its surface is generally flat with marshy areas, interspersed with many lakes, and resembles the prairies of North America. Much of its coast is sandy, but there are good harbours at Riga, Liepaja, and Ventspils. The climate is continental, and the natural vegetation is mixed deciduous and coniferous forests and cool temperate grassland. Rye, oats, barley, potatoes, and flax are the chief crops. Special attention is being paid to dairying, bee-keeping, and live stock breeding. The chief exports are flax, timber, butter, eggs, cereals, spirits, wood-pulp, and glass; and the chief imports are agricultural machinery and implements, machinery, colonial produce, hardware, foodstuffs, and textiles. *Riga* (378,000), the capital and chief port; *Liepaja* (Libau) (57,000), the second port; and *Ventspils* (Windau) (18,000), a small port, are the chief towns.

Lithuania. The Republic of Lithuania (20,000 square miles; 2,230,000 population) marches with East Prussia, Poland, Russia, and Latvia. It consists of low morainic lands, dotted with marsh and lake, and traversed by plateaux covered with dark pine woods. Its summers are cool, its winters severe. On the glacial soils in the forest clearings, crops of rye, barley, flax, hemp, beet, and potatoes are grown. The rearing and breeding of animals are important, the peasant proprietors obtaining their chief wealth from the production of wool, butter, cheese, and eggs (100,000,000 annually). In Lithuania Minor, the amber industry is important. Coal, of poor quality, is found, and lumbering is carried on in the forest districts. The chief exports are timber, flax, dairy produce, eggs, and cereals; and the chief imports are textiles, agricultural machinery and implements, hardware, foodstuffs, and colonial produce. *Kovno* (100,000), the capital and chief industrial centre; *Memel* (Klaipeda) (40,000), an old port; and *Shavli* (23,000), an interior route centre, are the chief towns.

Position, Area, and Population. Asia is pre-eminently the "continent of excesses." It possesses the highest ranges, peaks, and plateaux in the world, the vastest burning and frozen deserts, the greatest salt lakes, fifteen of the longest rivers, the largest peninsulas and seas, the deepest depressions, the regions of greatest heat and greatest cold, and the largest population, exhibiting the utmost diversity of race and language. Within its boundaries man first learned to till the soil, to build cities, to make laws, to carry on industry and commerce, and to produce a written language. All the great religions flourishing throughout the civilized world to-day and some of the earliest civilizations originated in it.

In shape an impressive parallelogram with prolongations in the peninsulas of Arabia, India, Indo-China, and Kamchatka, the continent stretches from west to east, between the Suez Canal and East Cape on Bering Strait, for 6,700 miles, and from north to south, between Cape Cheliuskin and a point near Singapore, for 5,300 miles. On all sides except the west, Asia is bounded by the ocean; on the north by the icy Arctic waters; on the south by the tropical Indian Ocean; and on the east by the Pacific, whose northern shore waters freeze in winter. On the west, Asia is extended into Europe, and is joined to Africa by the narrow Isthmus of Suez. From North America it is separated only by Bering Strait—less than twice the width of the Straits of Dover.

The area of the continent, including the islands, is 17,250,000 square miles—almost one-third of the total land surface of the globe, and more than that of the whole of the New World. More than half the people of the world live in Asia. Its population is estimated at 915,000,000, of whom more than three-quarters are in India, China, and Japan. All races of men are found, but the yellow type predominates. Asia is the home of the Mongolians, who are found in almost every corner of the continent. They are divided by Keane into the Northern Mongols of the north and central areas, and parts of Irania, and Asia Minor; the Southern Mongols of Tibet, Indo-China, Formosa, and some parts of Indonesia; and the Oceanic Mongols of Malaya, the Philippines, Formosa, and the Nicobar Islands. The White Race is represented by the Semitic type of Syria and Arabia, the tribes of the Caucasus, the Slavs of Siberia and Turan, and the Aryans of Iran and Northern India. Black races are represented by the negroid Dravidians of the Deccan and Ceylon, who differ in many respects from the Negritos of Malaya, who have probably a large proportion of Mongoloid blood.

Coast Line. The coast line is irregular, being more than three times the minimum periphery. In comparison with its size this coast line, approximately 50,000 miles, is not favourable to the development of commerce. The north coast is low, flat, and dreary, and blocked with ice, except for a few weeks in summer; the east is regular, save where the great rivers form deltas, and has fringing islands and inland seas; the south has open seas, few islands, and few important inlets for commerce; and the west has a paucity of good harbours. A large proportion of land is more than 1,000 miles from the sea.

Relief. Asia is now widely linked with Europe,

but in an early age it was separated from it by a sea which connected the Arctic and Indian Oceans. Four great physical divisions of the continent may be distinguished—the North-Western Lowlands, the Central Highlands and Plateaux, the Southern Plateaux, and the Eastern Margins and Island Ranges. Beyond the Urals stretch the great plains of Siberia, formed of sedimentary rocks, and drained by the Ob-Irtish, the Yenisei-Angara, and the Lena. In the south-west there is an area of inland drainage, where the Aral Sea receives the waters of the Syr-Daria and the Amu-Daria. The Central Mountain System is the largest, broadest, highest, and most complicated in the world. Generally speaking, the mountain chains run in an east and west direction, and between them are lofty plateaux, which are wider in the east than in the west. Two structural groups may be distinguished: a series of young folded ranges enclosing plateaux and deep valleys, and a much older folded eastern mass which has been very much worn down. In the first group, three chains come very close together in the lofty Pamir plateau. They are the Caucasus and Thian Shan; the central chain consisting of the Pontic, Elburz, Hindu Kush, and Kwen-Lun Mountains; and the Taurus, Zagros, Sulaiman, and Himálaya Mountains. Between the first and second chains lie the great basins of the Black Sea, the Caspian Sea, and the Tarim basin; whilst between the central and third chains are the plateaux of Asia Minor, Iran, and Tibet. To the east of the high Tibetan plateau the folded ranges turn southward owing to the resistance of the old Chinese plateau, and a series of north and south chains traverses Indo-China. The older Eastern Highlands consist of uplifted blocks, which form the Altai, Sayan, Yablonoi, Stanovoi, and Khingan Mountains. From many of the mountains of this central system flow great glaciers, which give rise to the long rivers of the south and east—the Euphrates and Tigris from the Armenian plateau; the Indus, Ganges, and Brahmaputra from the Himálayas; and the Salwin, Mekong, Yang-tse-Kiang, and Hoang-Ho from the plateau of Tibet. Asia's mountain backbone has given birth to wild, nomadic conquerors; has isolated China; and has largely caused the deserts of the centre. The fertile river valleys encouraged the early civilization of China, India, and Mesopotamia, and still support a dense agricultural population. The two southern plateaux of Arabia and the Deccan, which at one time formed part of an ancient continent stretching thousands of miles in an east and west direction, rise in a few places to over 6,000 ft. They are separated from the plateau region of Africa by the rift valley of the Red Sea, and from the remainder of Asia by the Indo-Gangetic plain and low-lying Iraq. The eastern volcanic mountains border the eastern shores, and stretch through the peninsula of Kamchatka, the Kurile Islands, the Japanese Islands, the Lu-Chu Islands, the Philippines, the Moluccas, and the Sunda Islands. They form part of the "Fiery Ring of the Pacific," and contain Fuji-San, the sacred mountain of Japan, and Krakatao, the destructive East Indian volcano. Naturally, the peoples living on the unstable edge of Eastern Asia have become stoics and fatalists.

Many of the rivers are impressive and useful. Those of Siberia, with sluggish currents and mouths

closed by ice for nine months of the year, are the least important; but in Eastern Asia, the Amur and its tributaries play a role of ever-increasing importance. The Yang-tse-Kiang (3,000 miles) is one of the longest, and is the most important river on the continent. Ships can reach ports on its banks 1,500 miles from the sea. Scarcely less important is the Canton or West River, which gives access to Yunnan; and the Hoang-Ho by modern engineering science may regain its old importance. Hardly less inferior are the Ganges and Indus of India, and the Iráwadi, Salwin, and Mekong of Indo-China. Swelling the list are the less useful Tigris-Euphrates, Amu-Daria, and the Syr-Daria. In lakes Asia is deficient. The Caspian Sea and the Sea of Aral are the largest in size, and the Siberian Lake Baikal is remarkable in that its waters are fresh in contrast with all the others, which are salt.

Climate and Vegetation. Asia is very largely a continent of great extremes of climate—extremes of cold in the north, of heat in the south. At Verkhoyansk, 400 ft. above the sea, where “the pole of cold” is found, the mean temperature of the coldest month is -60°F. , and that of the hottest month $+60^{\circ}\text{F.}$ Over the Siberian plains and the steppes of Turan the range of temperature is very great. Only the south and south-east coastal lands have fairly uniform temperatures throughout the year, the range being about 10°F. The isotherms, reduced to sea-level, are grouped round an extremely cold area, under -40°F. in the north-east in winter, and round an extremely hot area, over 90°F. in the south-west in summer. The seasonal temperature changes determine a winter high-pressure system, which is most powerfully developed over Mongolia, and a summer low-pressure system, which is most intense between the Middle Indus and the Gulf of Oman. Dry, cold, outflowing, winter monsoon winds, therefore, give Asia hardly any rain, the only exceptions being where the winds are deflected upwards by mountains, especially after passing over the sea. On the other hand, summer inflowing monsoon winds, passing over the sea, carry rain to all regions, except the south-west and the lands in the lee of the great mountain barriers. The fall is greatest where the course of the surface wind is normal to that of the great mountain ranges, as in the western mountains of the Deccan and Burma and the eastern ranges of the east coast. Six climatic regions may be distinguished: (1) The Arctic Cold Dry Area lies almost wholly within the Arctic Circle. Its warmest month is not over 50°F. , and its mean rainfall never over 1 in. in the wettest month. (2) The Siberian Area has great severity of winter cold (January temperature under 0°F.), but the summer temperatures range from 50°F. to 75°F. Most rain falls in summer, the mean annual rainfall ranging between 5 in. and 10 in. The temperature extremes are greater in the east than in the west. (3) The Central Arid Area, including Arabia, Iran, Turan, Taklamakan, and Gobi, is one of varied elevation and of varied temperature conditions. Most of it is very dry (mean annual rainfall much less than 10 in.), slight winter rains characterizing the west, summer rains the east. Once a region favoured with sufficient rainfall, a fertile soil, and a prosperous civilization, desiccation has brought about its decay. (4) The Monsoon Area is divided into the East and South

Monsoon Regions. The former, which includes China and Japan, has a uniform July temperature, over 70°F. in Japan and over 80°F. in China; but with a January temperature that varies from 60°F. in the south to under freezing point in the north. The rain falls in summer, except on the west coast of Japan, and is over 40 in. in most parts, and over 80 in. on some exposed mountain slopes. In the Southern Region, which includes India and Indo-China, the temperature is never lower than 60°F. , and the rains (very heavy in some areas) fall in the summer months, except in the south-east of both peninsulas, where the maximum is in winter. (5) The Sub-equatorial Area (Malaya, Ceylon, and the extreme south of the Deccan), characterized by two rainy seasons, is always warm and wet. (6) The Mediterranean Area, which includes the Levant, Syria, and Palestine, has cool, wet winters and warm, dry summers.

The vegetation regions are as varied as the climatic. On the Arctic margin is a belt (100 to 500 miles wide) of tundra, frozen swamps producing masses of lichen and stunted bushes with a few wild berries. Lying nearly 1,000 miles on each side of 60°N. Lat. , and extending 4,000 miles from east to west, is the forest belt, the largest timbered area in the world, coniferous in the north, deciduous in the south, almost uninhabited and untouched. Southwards the forests merge gradually into the Steppes, which occupy the south-west plains from Omsk to the Iran Plateau. They are of two kinds, grass steppes bordering the forests, and poor steppes passing into sterile deserts. These deserts stretch from the Red Sea almost to the Yellow Sea, and are mostly a succession of plateaux, often bounded or separated by high mountain ranges. Here and there oases watered by wells or rivers occur. In the west lies the Mediterranean Region with the typical vegetation of dry evergreen (or ever-grey), hard leaf forests, woods, and shrubs. Tibet and the higher mountains form the High Mountain Desert. Deciduous woods are found in the northern half of Japan; while in the south of Japan and the east of Korea (Chosen) are the dense wet forests of the mild temperate regions. The higher and less rainy regions in the southern and south-eastern peninsulas and south-eastern regions are rich savannas. In the moister lower regions of southern and south-eastern Asia are the dense wet jungles, with a rich vegetation of giant banyans, screw pines, lofty palms, and other great trees.

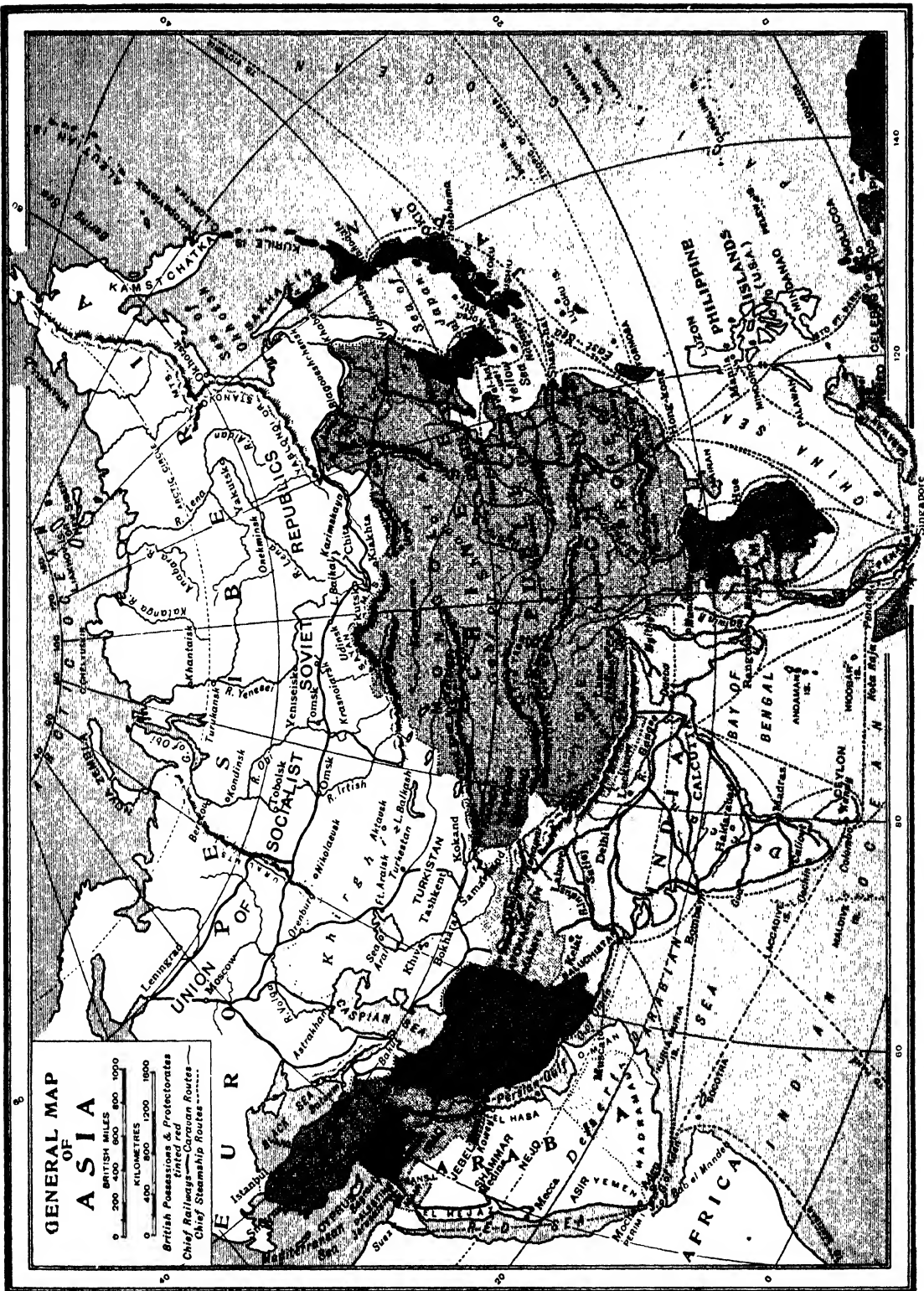
Economic Conditions. The greater bulk of the population of Asia live as their forefathers did thousands of years ago, but eastern and south-western Asia have been affected, to a greater or less extent, during the past century by European civilization. Agriculture is the leading industry, and in China, Japan, and India, the soil, most carefully cultivated, yields marvellous crops. Some important agricultural products are: wheat in India and Siberia (one-eighth of the world's crop); cotton in India and China (a quarter of the world's crop); tobacco (one-third of the world's crop) in the Mediterranean, monsoon, and tropical countries; cane sugar (one-half of the world's crop) in the tropical areas; rice in the southern and eastern flood plains, and tea on the hill slopes of Ceylon, China, India, Java, and Japan (almost all the world's production of these products); dates in the

GENERAL MAP OF ASIA

BRITISH MILES
0 200 400 600 800 1000

KILOMETRES
0 400 800 1200 1600

British Possessions & Protectorates
Chief Railways—United red
Chief Steamship Routes—dotted



deserts; coffee in Arabia, India, and the East Indies; fruits in the Mediterranean area; millet in the drier monsoon areas; and fibres (hemp, jute, silk, coir), plantation rubber, pepper, tapioca, camphor, dyestuffs, and drugs in the monsoon and tropical regions.

Pastoral farming prevails over the greater part of Asia, but engages relatively few individuals. It has as its typical animals the reindeer of the tundra; the yak of the mountains; the elephant of the tropical swamps; the cattle, sheep, horses, and goats of the steppes and semi-arid tracts; and the camel of the deserts. More cattle are found in Asia than in any other continent except Europe, but they are largely of the zebu type, kept largely for hides and transport. Hunting and fishing are the chief occupations of the people of the north. China has large river fisheries. Among typical products of the seas are the pearls and pearl shells of the Red Sea, the Gulf of Manaar, the South China Sea, and the Persian Gulf; the coral of the Red Sea, Japan, and the South China Sea; the cuttle-fish of Yezo; the turtles of Malay waters; the shark fins of Burma and Sumatra; and the trepang of the coral reefs. The vast forests of Siberia and the wet jungles are hardly yet exploited.

Asia is rich in mineral wealth, but development has been small. Vast supplies of coal await development in Siberia and China. About 5 per cent of the world's coal is, at present, mined in India, China, and Japan. Iron is found in Asia Minor and the Elburz Mountains, but much more in India, China, and Siberia. The gold mining in the regions north and south of the Amur, in the eastern lands from Okhotsk to Sumatra, and in South India and Asia Minor, though now yielding less than £500,000 per annum, may one day rival the production of North America. Malaya produces half the world's tin, and petroleum is important in Japan, China, the East Indies, Caucasia, Burma, India, and Persia. Other important minerals are silver in Japan; copper in China and Japan; mica in India; plumbago in Ceylon (most of the world's output); kaolin in China and Japan; lead, zinc, manganese, antimony, mercury, and precious stones.

Domestic manufactures of all kinds flourish, but as yet the modern factory system of Europe is important only in India, Japan, Russia, and parts of China.

Political Divisions. In the west, Turkey, Persia, Afghanistan, and Arabia; in the east, the Chinese Republic, Korea (Chosen), Japan, and Siam have not been absorbed by European powers. The Northern Lowlands are controlled by Russia. Iraq and Palestine are under British mandate. India, Ceylon, much of the Malay peninsula, the north of Borneo, and numerous smaller possessions, such as Cyprus, Aden, most of the islands in the North Indian Ocean, and Hong Kong are under British control. The French own the eastern part of the Indo-China peninsula, and have several small colonies in India; and Syria is under French mandate. Portugal possesses three settlements in India, Macao in China, and the eastern half of the island of Timor. The Philippines belong to the United States; the other islands of South-Eastern Asia to the Dutch.

Persia. *Description.* The Kingdom of Persia (628,000 square miles; 10,000,000 population), lying to the east of Iraq and between the Caspian Sea and the Persian Gulf, occupies the western part of

the Plateau of Iran. Most of it is made up of tablelands, which in the north-west are over 5,000 ft., but in the east, towards the borders of Afghanistan, sink to below 2,000 ft. About one-third of the country is occupied by deserts and saline wastes, considered to be irreclaimable and useless. The centre is one vast desert stretching from the neighbourhood of Teheran to the deserts of Baluchistan. In the east are the Seistan swamps and marshes, which vary in extent according to the season; and in the north are huge salt swamps. Generally speaking, the winters are intensely cold, and the summers hot over the greater portion of the country. On the plateau the climate is extreme (Teheran: January, 34° F.; July, 87° F.). The rainfall is low (Teheran and Meshed under 10 in.; Ispahan under 5 in.), falling chiefly in winter, and night dews are important sources of moisture.

Productions and Industries. Agriculture is important. Of necessity the cultivated areas are restricted, the most fertile areas being in the north and north-west, the alluvial lowlands at the head of the Persian Gulf and part of the trough of Seistan. Irrigation is necessary in most parts. Wheat, barley, millet, maize, and the vine are produced in the valleys; and cotton, tobacco, lucerne, clover, and the opium poppy on the plains. Sesame and other oil seeds, onions, beetroot, and turnips are widely grown. Many medicinal and dye-yielding plants are grown, and gums are abundant. The main agricultural wealth lies in fruit trees. Pears, apples, quinces, apricots, plums, cherries, peaches, and mulberries are grown on the plateau; figs, pomegranates, almonds, and pistachios in the less cold districts; and dates, oranges, lemons, and limes in the lowlands. Silk is an important product in the Caspian provinces and in the neighbourhood of Yezd. Shiraz is world-famed for its rose gardens. Fat-tailed sheep, goats, and camels are reared, and provide raw material for Persian carpets and felted cloth. Minerals are abundant, but (except petroleum) little worked. Petroleum appears to be everywhere between Baku and the Persian Gulf. The Anglo-Persian Oil Company has important borings at Maidan-i-Naftun, from whence a pipe-line runs to the refineries on the island of Abadan (annual production, 5,300,000 tons). Copper is worked near Kerman, Ispahan, and Nishapur; coal and iron near Teheran, and along the southern flanks of the Elburz; and turquoises are found near Nishapur. The carpet manufacture, which is largely in British hands, is the most important manufacture. There are modern factories at Tabriz and Hamadan; but the bulk of the industry is carried on, and the best of the carpets are made in the tents of the nomads. Ispahan and Yezd are famed for woollen felts, and Kerman makes excellent shawls. Other native industries are the fashioning of sword-blades, brass and copper vessels of all kinds, carved and inlaid metal and wood, and ornamental tiles.

Communications and Commerce. Roads are poor, and railways are extensions for a few miles into the kingdom from adjacent countries. Caravan traffic is the rule. Steamers reach the Caspian and Persian Gulf ports, but port facilities are needed. Most trade is with Russia, Great Britain, Egypt, the United States, Turkey, and Iraq. The chief exports are petroleum, carpets, opium, fruits, cotton, rice, skins, gums, raw silk, tobacco, drugs, silk-stuffs,

PRODUCT MAP OF ASIA

BRITISH MILES
0 200 400 600 800 1000
British Possessions shaded diagonally or underlined.



LONGITUDE EAST 80 FROM GREENWICH

and precious stones; and the chief imports are sugar, tea, rice, spices, animals, cotton tissues, cotton yarn, gold and silver coins, flour, tissues of pure wool, indigo, haberdashery, silk tissues, cigarettes, machinery, and hardware.

Trade Centres. The chief towns are: Teheran (350,000), the capital and largest city; Tabriz (200,000), the commercial capital; Ispahan (100,000), the central trade centre; and Meshed (85,000), a pilgrim centre.

Afghanistan. *Description.* The Kingdom of Afghanistan (245,000 to 270,000 square miles; 11,000,000 population), lying between British India and Persia, occupies the eastern part of the Iran Plateau. It is a very rugged upland country, rising to Himalayan altitudes in the north, gradually shelving southwards towards the deserts of Baluchistan, never approaching sea-level, but always within sight of the everlasting hills. These extend in long, trailing offshoots from the great central divide of the Hindu Kush, rising sharply and aggressively in comparatively narrow ridges as they trend south-westward; but massed in mighty form and irregular build as they buttress that divide on the north, leaving only a scanty opportunity for a width of well-irrigated and fertile plain between the foothills and the Oxus. Quite three-quarters of the country is mountainous, the elevation being generally over 4,000 ft.; but the valleys of the main rivers are wide and spacious, and the Oxus, Kabul, Helmund, and Har-i-Rud, all flow through plains rich with cultivation, where wonderful irrigation is practised. The climate is noted for its extremes of temperature, the variations ranging from -12° F. in winter to 120° F. in the shade in the hot weather. For nine months of the year there is almost continual sunshine, marred only by frequent high winds and dust storms.

Productions and Industries. Mineral wealth is comparatively great, but is not exploited. Agriculture in the fertile plains and valleys is of great importance, two harvests a year being common, one of wheat (the staple food), barley or lentils; the other of rice, millet, tobacco, beet, turnips, maize, and dal. Peaches, figs, grapes, mulberries, and melons are grown in great abundance. Fat-tailed sheep form the principal native meat food. Silk at Kandahar and Herat, felts, carpets, camel and goat hair articles, and sheepskin coats comprise the manufactures. There are no navigable rivers, no railways, and only the roads over the Khyber and Bolan passes to Kabul and Kandahar respectively are fit for light-wheeled traffic.

Commerce and Trade Centres. Of exports to India, wool is the staple item, and in a lesser degree silk, dried fruits, assafoetida, raw wool, and ghee; while the imports therefrom, are chiefly cotton yarn and piece goods, metals, leather goods, tea, sugar, arms, and ammunition. There is a limited trade with Russia and Chinese Central Asia. Kabul (100,000), the capital and controlling centre; Kandahar (60,000), the chief commercial centre; and Herat (30,000), a manufacturing centre, are the chief towns.

ARABIA

Political Divisions. The large Arabian peninsula in south-western Asia, lying between 13° N. and 33° N. Lat., forms the connecting link between

Asia and Africa. It has an area of over 1,000,000 square miles, and a population estimated at 5,000,000 to 7,000,000. Politically it is divided into: (1) the Kingdom of the Hejaz (150,000 square miles; 500,000 population), the Imamate of Asir (700,000 population), and the Imamate of Yemen (74,000 square miles; 750,000 population), all coastal lands of the Red Sea; (2) Aden, Perim, Socotra, and the Kuria Muria Islands (politically part of British India); (3) the Emirate of Hasa on the western shore of the Persian Gulf; (4) the Sultanate of Koweit on the north-west coast of the Persian Gulf; (5) the Sultanate of Oman on the south-eastern coast (82,000 square miles; 550,000 population); (6) Hadramaut on the south coast (82,000 square miles; 150,000 population); (7) the Emirate of Jebel Shammar inland (200,000 Bedouins); (8) the Emirate of Nejd, central, the true home of the Arab; and (9) the Emirate of Kerak (Transjordan) in the north. The organization of these native states is being developed under British auspices, the principal rulers being subsidized.

Relief and Climate. The west coast, 1,800 miles long, with no inlet of any size, has no good harbour, but open roadsteads, made difficult of approach by shoals and coral reefs. Yembo, Hodeida, and Jeddah are the chief outlets. The south coast possesses an excellent harbour in Aden, and Dhofar harbour is good. On the east coast, Muscat and Koweit are fine natural harbours, but the Persian Gulf has lost much of its old importance.

Arabia is a huge old plateau, a fractured and tilted block, 3,000 ft. in average elevation, buttressed by precipitous mountains, sloping sharply to the west and gently east to Muscat, and north-east to Basra. In Yemen some peaks reach an altitude of 10,000 ft.; and Nejd has an elevation of 2,500 ft., with outstanding masses rising to nearly double that height. There are no perennial rivers. The chief features of the country are the deserts, which are as various as the mountains and valleys of more favoured lands. Four regions may be distinguished: the coastal, fruitful strips of small extent; the mountain rims; the vast ring of sterile desert, dotted here and there with oases, lying behind the mountains, and largely unexplored; and the central plateau (Nejd), with long undulating slopes, traversed by narrow and deep valleys, the true home of the pure Arab, the Arab horse, and the Arab camel.

Heat is a characteristic feature of the climate, and the southern region is within the zone of maximum July-August temperature. The hottest regions are the coasts of Yemen and Oman. North of the desert winter rains occur, and the south and south-west receive monsoon rains. The most favoured inland region is Jebel Shammar, which receives spring rains. Southward the precipitation rapidly decreases, and the southern desert usually receives a mild shower only once in several years.

Productions and Industries. The physical conditions constrain the majority of the tribesmen to a nomad life. The coastal districts produce considerably more than their essential food supply, but the interior depends upon them for maintenance, producing only gums, butter, hides, wool, and camels. Agriculture is practised mainly in Yemen, Nejd, and Oman. Yemen is really "Araby the Blest."

Terrace cultivation receives much attention, and among its agricultural products are the famous Mocha coffee, fruit, grain, vegetables, coconuts, betel, bananas, almonds, and roses. Oman produces good cotton. On the oases of the Nejd, dates, grains, peas, and beans are raised. Senna is grown in Southern Hejaz; balsam in the Safra region; henna on the west coast; frankincense, gums, and myrrh in Hadramaut; indigo on the shores of the Persian Gulf; and maize, wheat, barley, cotton, coffee, sugar, and spices in the humid valleys of the Tehama (coast strip south of Mecca). Considerable flocks are reared in the oases and fertile coast strips. The Bedouins roam over the pasture lands of the Nejd and the grassy margins of the deserts with their fat-tailed sheep, camels, goats, and horses. They breed an admirable type of fast-riding camels, and also large numbers of baggage beasts. Fine asses are bred in Hejaz. In some of the inland towns there exist simple manufactures, such as indigo-dyeing, weaving, and gold and silver work. The pearl fisheries of the Persian Gulf and the mother-of-pearl fisheries of the Red Sea are valuable.

Communications and Commerce. All routes are fundamentally pilgrim routes to Mecca, and depend upon water supplies and oases. The Hejaz Pilgrim Railway, following a trough west of the main gable ridge, has been constructed as far as Medina, and a small line connects Hodeida with Sana. From Bagdad and El Kalif caravan routes cross Nejd, and another route from Damascus leads by the western coast ranges to Mecca. The chief exports are coffee, dates, salt, mother-of-pearl, pearls, animals, wool, hair, hides, dyes, senna, henna, gums, incense, betel, dried fruit, oil of sesame, and drugs; and the chief imports are textiles, rice, grain, sugar, hardware, tobacco, and weapons. The shipping is largely controlled by Britain, the main trade of Arabia passing through the British port of Aden.

Trade Centres. The chief towns are: *Mecca* (85,000), the capital of Hejaz; *Medina* (30,000), an agricultural centre; *Sana* (20,000), the capital of Yemen; *Sabiyah* (20,000), the capital of Asir; *Hail* (12,000), the capital of Jebel Shammar; *Shebam*, the capital of Hadramaut; *Riyadh* (the capital of Nejd); *Jeddah* (30,000), the port of Hejaz; *Hodeida* (20,000), the port of Sana; *Koweit* (37,000), the chief port and town of Koweit; and *Muscat* (24,000), the capital and chief port of Oman.

Iraq. The Arab Kingdom of Iraq (177,148 square miles; 2,850,000 population), formerly Mesopotamia, comprises the former Turkish vilayets of Bagdad, Basra, and Mosul. Its history is the chronicle of the struggles of the races, who have held it, with the great rivers. Bounded by deserts and mountains, Iraq is a river-created and river-destroyed lowland with a growing delta, largely the gift of the two great rivers, the Euphrates and the Tigris, fed by the snows of Armenia. At Kurna, the Euphrates and Tigris unite, and their combined streams form the Shat-el-Arab. The delta of the great river is advancing at the rate of 72 ft. per annum, but the land is liable to inundation. The climate is of the desert type, marked by excessive heat and dryness with great extremes and sudden changes of temperature. In the hot weather (April to October) dysentery, fever, and scurvy hold sway.

Under British management, the control of the Euphrates, upon which depends the prosperity of

the country, is being accomplished. The Hindieh barrage was constructed before the Great War, and the British have since dug out some hundreds of canals, and brought thousands of acres under cultivation. Dates, wheat, barley, cotton, rice, ground nuts, beans, peas, maize, and gums form the main products. Dates flourish on the fertile lands near the Shat-el-Arab. Cotton growing is developing. Kurds and Arabs, nomadic and semi-nomadic, possess large flocks and herds of camels, horses, sheep, and goats; and hides and wool are largely exported. There are petroleum wells at Qacyarah, near Mosul, and at Mandali, and bitumen deposits at Hit. The local manufactures include earthenware, embroidery, carpets, copper vessels, baskets, and cloths.

Railways link Basra, Bagdad, and Kut-el-Amara. The Bagdad line now extends from Bagdad to Qalat Shergat, beyond Tekrit. The section *via* Mosul to Nisibin is not completed. When this is opened Iraq will have Smyrna and Alexandretta as northern ports. Iraq is a transit land, and it is estimated that more than five-eighths of the trade normally shown as belonging to the country really relates to transit to and from Persia. Most foreign trade is with the United Kingdom, Persia, and India. The chief exports are carpets, cereals, dates, wool, rice, hides, cotton, and gums; and the chief imports are sugar, tea, textiles, indigo, coffee, iron, and copper. The chief towns are: *Bagdad* (250,000), the capital; *Basra* (85,000), the chief port; and *Mosul* (90,000).

Palestine (10,000 square miles; 760,000 Moham-medan Arabs; 175,000 Jews; 91,000 Christians), under British mandate, lying between Syria and Arabia, has given to the world the noble conception of Christianity. It is made up of the Maritime Plain of Philistia and Sharon, a mountainous limestone plateau, and the Jordan Rift Valley. Its climate is of the Mediterranean type. The chief economic products are oranges (1,700,000 boxes annually), lemons, bananas, grapes, olives, mulberries, wheat, maize, millet, barley, almonds, tobacco, sesame, and honey. The main railway from Haifa to Kantara links up by ferry with the Egyptian State Railways, and other railway sections are the Haifa-Acre-Samakh, the Jaffa-Ludd-Jerusalem, the Rafa-Beersheba, and the Nablus-Apule-Tulkcran. Most trade is with the United Kingdom, Egypt, Syria, and the United States. The chief exports are oranges, soap, olive oil, almonds, barley, wheat, figs, lemons, tobacco, wool, hides, raw silk, sesame, melons, and wine; and the chief imports are cotton textiles, cotton yarn, sugar, petroleum, coal, flour, iron and steel goods, building material, machinery, timber, cigarettes, and cement. *Jerusalem* (91,000), the capital; *Jaffa* (51,000), the chief port; *Haifa* (50,000), a port; and *Nablus* (20,000), an agricultural centre, are the chief towns.

Syria (60,000 square miles; 1,800,000 population), under French mandate, is a Levantine country, bounded on the west by the Mediterranean Sea, and on the east by Iraq. It consists of a tableland of cretaceous limestone, with strata of recent sandstone and lignite, and dykes of basalt, crossed from north to south by a great rift valley, and drained by the Orontes and Leontes flowing to the Mediterranean Sea, and by the Jordan flowing to the salty Dead Sea (1,300 ft. below sea-level). On the whole,

the climate is of the Mediterranean type, though varying greatly in different parts. Agriculture and the pastoral industry are the principal occupations. Ten per cent of the area is under crops, the chief of which are wheat, maize, durra, oats, vegetables, fruits, mulberries, dates, olives, tobacco, cotton, sesame, hemp, chick-peas, lentils, and vetches. The richest wheat lands are in the Baka'a (Lower Orontes Valley) and on the volcanic soils of the Hauran; and the most important silk-producing region is in Lebanon. From Beirut come the best oranges; and around Latakia, Tripoli, Aleppo, Beirut, and Damascus are rich hemp and tobacco lands. The best cotton is produced in the hinterland of Alexandretta. Fishermen ply their trade from Tyre to Alexandretta, and the sponge fisheries at Latakia meet with considerable success. Rich iron ore is mined at Majerba; lignite round Damascus; and copper east of Aleppo. Lebanon is famous for its marble and building stones.

Communication by rail is established with Egypt, the Hejaz, Iraq, and the Bosphorus. Lines connect Beirut with Damascus; Rayak with Aleppo; Beirut with Mameltein; Homs with Tripoli; and Damascus with El Hammé. From Alexandretta a line runs northward to link up with the famous Bagdad Railway; and from Aleppo the Hejaz Railway runs through Hama, Homs, Damascus, and Maan to Medina. Most trade is with France, Britain, the United States, and Germany. The chief exports are wheat, fruit, wool, hides, tobacco, raw silk, and oils; and the chief imports are textile fabrics (mainly cottons), iron goods, machinery, motors, paper, glass, and drugs.

Damascus (170,000), the capital; *Aleppo* (140,000), the chief city of the north; *Beirut* (80,000), the

chief port and administrative capital; *Tripoli* (30,000), a port; and *Alexandretta* (15,000), the principal seaport of North Syria, are the chief towns.

Aden (75 square miles; 55,000 population) is a peninsula on the south coast of Arabia, on the Gulf of Aden, about 100 miles east of the Strait of Babel-Mandeb. The harbour is excellent and the place is strongly fortified and garrisoned. Aden is a portion of British India and the emporium of the whole trade of Southern Arabia. It is also the centre of the British Protectorate over the neighbouring Arab tribes; while politically dependent upon Aden are the Kuria Muria Islands, valuable for their guano, and the protected island of Socotra. Dates and coffee are exported, and an immense trade in cotton goods, coal, grain, sugar, and hides is carried on with neighbouring countries.

Cyprus (3,584 square miles; 348,000 population; mainly Greek) is an island, lying in the extreme north-east corner of the Mediterranean Sea. Freed from the paralyzing hand of the Turk by its annexation to the British Empire in 1914, it has made progress. Ranges of mountains edge it on the north and south, shutting off moisture from the long interior plain, the Mesaoria. Its annual rainfall is only about 23 in., and irrigation is necessary. The chief agricultural products are wheat, barley, vetches, olives, millet, maize, aniseed, sumac, dates, cotton, grapes, carobs, fruits, linseed, cheese, wool, hides, sugar, and sesame. Sponge fishing is carried on in the Mediterranean waters. Copper, magnesite, gypsum, and asbestos are the chief minerals. *Nicosia* (19,000), the capital; *Larnaka* (10,000), a port; *Limasol* (13,400), the most modern town; and *Famagusta* (8,000), a growing port, are the chief trade centres.

Position, Area, and Population. India, a sub-continent rather than a country, includes the middle, lozenge-shaped, southern peninsula of Asia, washed by the Arabian Sea and the Indian Ocean, and the mountainous lands of Baluchistan and Burma. Within an area of 1,805,332 square miles—not one twenty-fifth part of the land surface of the earth—it has a population of 353,000,000, or more than one-sixth of the total population of the world, and more than three-quarters of the total population of the British Empire. Beyond the sea, the Indian Empire includes the Andaman and Nicobar Islands in the Bay of Bengal; the Laccadive and Minicoy Islands in the Arabian Sea; Aden on the coast of Arabia; Perim, at the entrance of the Straits of Bab-el-Mandeb; and protectorates over Sokotra, Bahrain, and various chiefships along the Arabian coast from Aden to the Persian Gulf. The British Provinces, administered directly by the British, comprise 61 per cent of the area, and nearly 78 per cent of the population; the remaining Indian Native States are governed by native rulers under the guidance of a British resident.

In no other equal area in the world is there found a population divided so greatly into distinct and independent communities, owning no brotherhood of religion, language, race, or social intercourse. Amalgamation of nations is absolutely unknown. Two-thirds of the population (Hindus and a very few Iranians) are of the Mediterranean race, and only one-fifth (Dravidians and Kolarians) is negroid, the rest being Mongoloid (mainly Tibeto-Burmans). Europeans number less than half a million. The most densely peopled regions are the Ganges and Brahmaputra basins, the eastern coastal plains, part of the Punjab, and Lower Burma; and the least peopled region is the desert of Thar. On one-quarter of the area live two-thirds of the people.

Coast Line. The coast line of the peninsula, in spite of its length of 3,000 miles, is singularly devoid of indentations, except at the mouths of the larger rivers and towards the northern portion of the west coast. Accordingly, the only harbours, except for light draught vessels, are found a little way up the deltas of the chief rivers, or where, as at Bombay, a group of islands provides adequate shelter from the open sea. The Madras Presidency boasts no single natural harbour which will admit ocean-going ships. Madras alone, through which half the sea-borne traffic of the south passes, has an artificial harbour. From Bombay southward to Goa the coast is called the Konkan coast, and south of this is the Malabar Coast. On the east, Madras is on the Coromandel Coast, and the Golconda Coast extends from the mouth of the Krishna to the mouth of the Mahánádí; beyond stretches the Orissa Coast to the Hugli mouth of the Ganges.

Relief. India consists of the Deccan tableland with its very narrow western but much wider eastern coastal plain; the Indo-Gangetic flood-plain; the mountain slopes bordering it; the Iráwadi and lower Salween basins, which form Burma; and the Baluchistan portion of the Iranian plateau.

The Deccan is an ancient plateau, lying south of the Vindhya. In the north-west the Deccan Trap has weathered into a black soil, retentive of moisture and rich in lime, which proves very favourable to cotton cultivation. A large part of the plateau is

covered with red laterite, dry, and porous, and suitable only for grassland and scrub. Broken and rocky, varying in height from 1,500 ft. to 2,500 ft., and with a generally gentle slope from west to east, the Deccan is enclosed by the Gháts (steps) of the east and west. The Western Gháts are a formidable barrier, extending in unbroken line the whole length of the coast, and ranging in elevation from 2,500 ft. to nearly 9,000 ft. South of the garden-like Nilgiris or Blue Mountains, where the Gháts meet, is the famous Palghát Gap, used by the railway, which links Calicut with Madras. The Eastern Gháts are an ill-defined range, disjointed groups of hills with no summit of 6,000 ft., which in the south recede from the coast, leaving room for wide stretches of fertile lowlands. To the south of the much disturbed, folded Aravalli Hills lies the Vindhya or Malwa plateau, at the foot of whose southern escarpment, the Vindhya Mountains, the Narbadá seeks the Gulf of Cambay. South of the Narbadá, and between it and the Tapti, which also flows to the west, are the Satpura Mountains, broken by the Khandwa Gap, used by the railway from Bombay to the Ganges Valley. Four great rivers—the Mahánádí (520 miles), the Godávari (900 miles), the Kistna (800 miles), and the Cauvery (472 miles)—rise in the west, cross the Deccan, cut their way through the Eastern Gháts, and form rich, alluvial deltas. They have been harnessed in the latter part of their courses by great masonry dams, from which a network of irrigation channels stretches throughout the deltas, and in their upper courses the waters are utilized to generate power for electricity.

Flanking the mighty, northern Himálavan mountain barrier is the amazing depression of the Indo-Gangetic flood-plain, the floor of a very ancient departed sea, covered by recent alluvial deposits. Throughout the plain, the only part that rises above 600 ft. is on the watershed between the Ganges and the Indus, from which the country slopes down to the sea. The Indus (1,800 miles), rising on the Tibetan plateau, after a north-western course, bursts through the mountains at an acute angle, collects in a deep and rapid stream its chief tributaries, the Sutlej, Chenab, Ravi, Beas, and Jhelum, which give their name to the Punjab (Five-river land), and becomes south of Multán, a broad and navigable river, sometimes making a much-divided course through open plains, and occasionally confined within definite banks till it reaches its huge delta south of Karáchi. Unwatered practically by the monsoon rains, the Indus basin depends largely on irrigation. Vast irrigation schemes have been carried out and others are in progress. To the south the Indus basin tails off into the wastes of the "Thar" or Indian desert, and, at its best, the Indus plain is a grey, treeless region. The Ganges (1,550 miles) draws its waters from the Himálayas and the Tibetan plateau by means of five great tributaries—Jumna, Gumti, Gogra, Rapti, and Gandak—and in a much lesser degree from the Deccan edges in the Chambal and Son rivers. Two hundred miles from the Bay of Bengal, the river breaks up into the numerous distributaries of its delta, which terminates in the deadly swamps and flats of the Sundarbans. In spite of its tidal bores and shifting mudbanks, the Hugli mouth is the most important. Seventy-five miles from the Bay of Bengal, the Brahmaputra (1,500 miles) makes a common estuary

with the Ganges in the Meghna, which is accessible to ocean-going steamers as far as Gaubati. Three hundred thousand square miles of flat, deep, rich alluvium make up the Ganges plain. In it arose the most ancient cities, and to-day it supports the densest agricultural population. There is a network of irrigation canals between the Ganges and the Jumna, and around the Ganges-Son confluence.

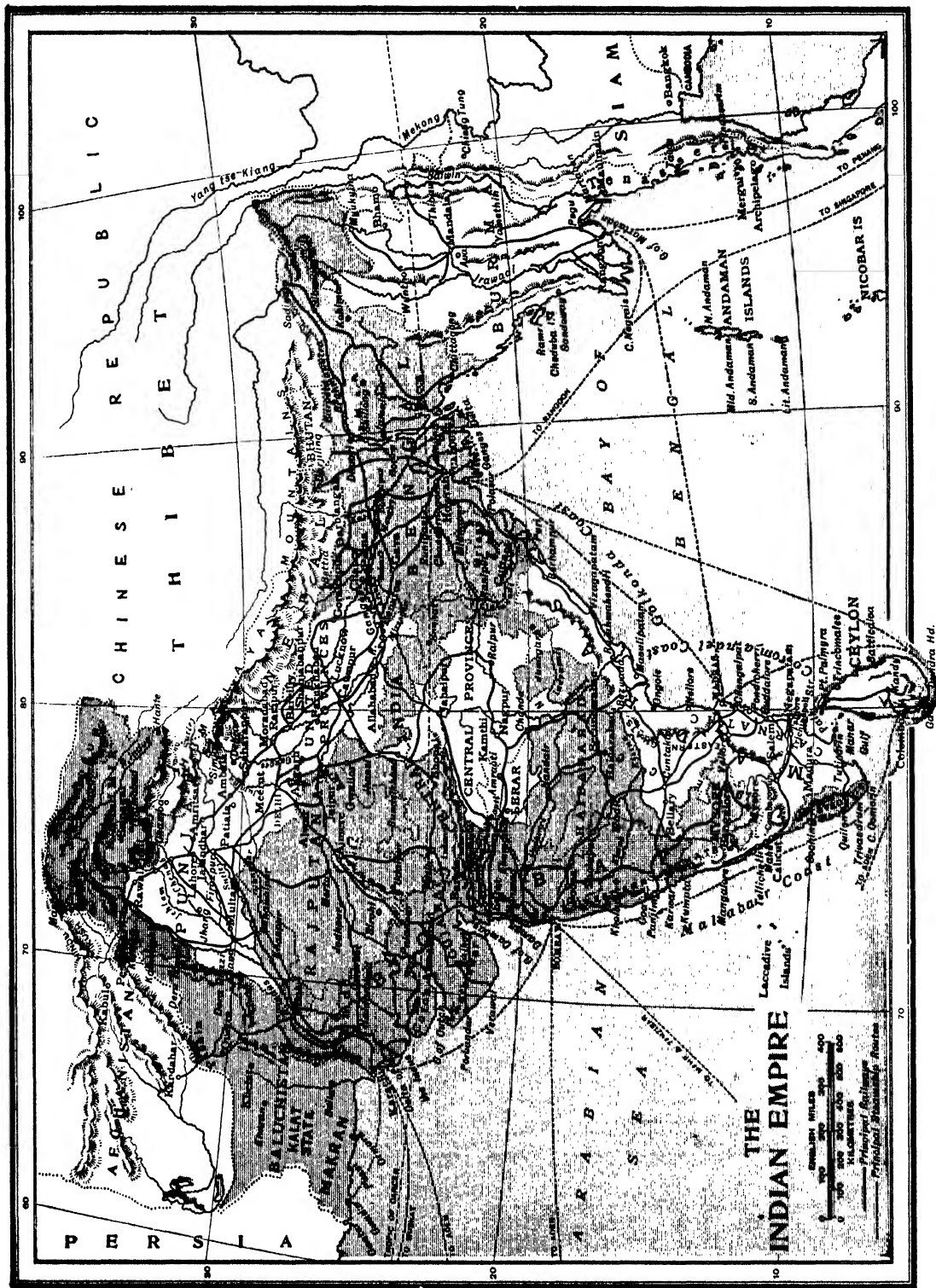
North of Peshawar and east of the Indus, the mighty young folded Alpine or Himálayan barrier trends south-east for 1,500 miles to the great bend of the Brahmaputra, presenting an unbroken wall pierced only by passes from 17,000 ft. to 19,000 ft., and overtopped by peaks reaching 23,000 ft. to 29,000 ft. Its nucleus lies just beyond the Indian frontier, in the Pamirs ("roof of the world"). Nowhere less than 100 miles wide and frequently approaching 200 miles wide, the mountain system consists of several parallel and converging ranges (mean height, 18,000 ft.), intersected by enormous valleys and extensive tablelands. Among the highest peaks are Everest (29,141 ft.), the world's highest peak; Káncanjanga (28,146 ft.), and Dhaulágiri (26,826 ft.). To the Himálayas India owes its main river systems, and its complete protection on the north. East-south-east from the Pamir plateau strike the three great parallel ranges of the Karakoram Mountains, containing Mount Godwin Austen (28,250 ft.), and Dapsang (28,000 ft.); while the Hindu Kush Mountains strike in a westerly or south-westerly direction. Running almost due north and south, the limestone Suláiman Mountains send out many spurs to the west, and descend by terraces to the Indus plain. Farther south, the Hala range rises above the Indus plain. Less lofty and imposing and less continuous than the Himálayas, these western mountains are traversed by several routes (Khyber, Gomul, and Bolan passes), which, though difficult, are quite practicable for large armies. Through these cracks in its armour India has from time immemorial been invaded. The rock-strewn ways of Baluchistan, the defiles of Central Afghanistan, and the rocky gates of the Kabul basin, all debouch into the Indus valley. For self-preservation, therefore, the political boundary has been pushed into the mountains to include country geographically non-Indian—Baluchistan and a subsidized Afghanistan. Burma comprises the great river valleys of the Iráwadi, Chindwin, Sittaung, and Salween, hemmed in by folded mountains—the Shan plateau, the Arakan, Chin, and Patkoi hills, and the snowclad mountains of the rim of the Tibetan plateau—running generally north-south, which are a part of the Himálayan uplift against the Chinese plateaux. The eastern frontier is less protective than it looks.

Climate. The climate ranges from Alpine to tropical, but is essentially of the monsoon type. Two broad seasonal divisions of the year may be distinguished—the dry season from December to May (cool, mid-December to February; hot, March to May), when the dry north-east monsoon is blowing from the interior of Asia; and the wet season from June to early December (June to September, the time of the rains; October to early December, the retreat of the monsoon), the time of the south-west monsoon, which brings moisture from the Indian Ocean. The Western Gháts and Arakan slopes, the southern slopes of the Assam hills and

of the Himálayas, and the north-western part of the Deccan have very heavy rainfalls—over 12 in. per month at most stations (Cherrapunji, mean annual rainfall, 465 in.). North-western India has its winds mainly from the dry west, and its slight rainfall is cyclonic. The mean annual temperature is greatest (over 85° F.) in the south at some distance from the coast. In the cool months, temperatures over 80° F. are found only in the south-west, while the isotherm of 65° F. crosses the Punjab; but in the hot months, none of this area has a mean temperature under 80° F., and the hottest region is in the head of the Deccan, where it is over 95° F. During the rainy season, the area with the highest temperature (over 95° F.) moves to the north-west, and is found first over the Punjab, and later over Baluchistan. The range of temperature is very small in the south, and is greatest in the Indus valley. In the hot season, all who can leave the cities for the hill stations. Darjeeling is convenient for Calcutta, and Simla for Delhi. Famines are caused by the failure of the rain-bearing monsoon to bring its accustomed load; but by irrigation works, relief works, improved railway system, and the supplying of food, the British Government has done much to mitigate and prevent famine conditions.

Communications. Good roads have been made in India, connecting all the chief towns. Many of the big irrigation canals, and the Ganges, Brahmaputra, Iráwadi, and Indus are highways for small craft. For short distances of 200 or even 300 miles, the old modes of transport by boat, cart, or pack animal, still hold their own. Development, however, has followed the railways, introduced in 1854. Trunk lines have been constructed to connect the four or five great cities for trade and strategic reasons, and branch and chord lines have followed to foster trade and to bring grain in reach of the famine areas. The total length of line is approximately 39,000 miles, half of which is standard gauge (5 ft. 6 in.).

Productions and Industries. *Agriculture.* Nearly three-quarters of India's vast population is supported by agriculture. The character of the land tenure and the social system prevailing attach the majority of the masses of India to their native villages, and small holdings of 5 acres or less are the rule. The chief crops are rice (83,000,000 acres; Bengal, Burma, Madras, the United Provinces, the Central Provinces, Assam, and Bombay); millet, the principal food (46,000,000 acres; widely cultivated); wheat, a winter crop (32,000,000 acres; Punjab, Agra, Oudh, Central Provinces, and Bombay); "Upland" cotton (24,000,000 acres; the north-western and central portion of the Deccan, the Jumna basin, the Punjab, and Sind); oil-seeds (widely cultivated, and especially in Bombay); sugar (Agra, Bengal, the Punjab, Oudh, and Eastern Bengal); jute (Northern and Eastern Bengal); tea (Assam; the hill-slopes of the Himálayas in Bengal, the United Provinces, and the Punjab, and on the Nilgiri Hills); coffee (Madras and Coorg); indigo (Bengal, Madras, the Punjab, and Agra); silk (Bengal, Assam, and the Central Provinces); opium (the Ganges valley and the Malwa plateau); coconuts (the Deccan coastlands); tobacco (Bengal, Madras, Bombay, the Punjab, and the United Provinces); and pulses (widely cultivated). India possessed some 129,000,000 horned cattle and 31,600,000 buffaloes, which are employed mainly for field operations and



road transport. Hides and skins figure prominently in the exports.

Forestry. The Indian State Forest Department controls forestry in British India. The largest forest reserves are in Burma (146,000 square miles), Assam (22,000 square miles), the Central Provinces, and Madras. Among the chief timber and other trees are the sal, deodar, teak, bamboo, red cedar, rosewood, ebony, satinwood, and saj.

Mining. The mineral wealth is fairly great, but has not been much exploited. Coal (23,000,000 tons), of poor quality, is widely distributed. The chief coal-fields are the Damodar Valley (Rániganj, Giridih, and Jherria), the Umaria, the Warora, the Singareni, and the Makum. Iron ore (2,000,000 tons) is mined in Orissa, the Central Provinces, and Western Bengal, and there are large ironworks at Jamshedpur. Gold is important in the Nilgiri Hills and in the east of Mysore. Copper is abundant from Kumáun to Darjeeling. Salt is obtained from sea and lake, and the Salt Hills of the Punjab. Manganese is an important product in Bombay, the Central Provinces, and Madras. Bengal, Madras, and Rájputána produce more than half the world's mica. Extensive deposits of tin exist in Burma, especially in the southern part of Tenasserim. Petroleum occurs in the Punjab, the United Provinces, Baluchistan, and Assam. By far the most productive fields, however, are in the Iráwadi valley at Yenangyaung, Singu, and Yenangyat. Precious stones (agates, jasper, diamonds, and rubies) are obtained in the Deccan and Burma.

Manufactures. Manufacturers engage more than one-tenth of the total population. Most famous ancient hand industries still survive, but European competition has caused them to suffer. Cashmere shawls, the figured silks of the old towns, and Benares brass are well known. Since 1880 a vast economic and industrial transition has been taking place. The factory system has obtained a firm footing and, although mills are limited to a few prominent centres, great further development is certain. Native labour, though not very efficient, is cheap; coal can be obtained at reasonable prices; water-power is abundant; and raw material is available in large quantities. The cotton mills, largely owned by Indians, are found chiefly in Bombay, Ahmedábád, and Alwar. They consume the greater portion of the large crop, and supply Eastern markets with yarns and fabrics. The great jute-mills of Calcutta (Howrah), controlled by the British, rival those of Dundee, and silk-weaving mills flourish in Bengal. Paper is made from textile "waste" at Calcutta and Alwar; varnish and sealing-wax from lac at Mirzapur; tobacco at Trichinopoli and Dindigal; and iron and steel at Jamshedpur. There are numerous flour-mills (chiefly in the Punjab and Bombay); rice and sawmills in Burma and elsewhere; breweries in the barley regions (the largest is at Murree in the Punjab); oil-mills at Calcutta; coconut oil-mills and sugar refineries at Madras; shipbuilding yards at Bombay; indigo factories in Bengal; and leather factories at Cawnpore.

Commerce. The trade over the land frontiers is difficult and small. From Quetta goods of Eastern manufacture are sent to Persia by Seistan. Trade with Afghanistan is carried on from Quetta through Kandahar, and with Kabul through the Khyber

Pass. Leh, in the upper Indus, trades with Sinkiang over high passes (over 2 miles). Cottons are the chief imports, and hides, skins, and carpets, and the drug charas, are the chief exports across the frontiers. With Tibet trade is carried on by the Chumbi through the frontier station of Yatung, and with Eastern China through Kunlong Ferry.

Trade and transport occupy 23,000,000 of the population. Most trade is sea-borne, and is conducted mainly from the ports of Calcutta and Bombay (over 80 per cent), Madras, Rangoon, Karáchi, and Tuticorin. There are excellent cable and shipping services (largely British) with all parts of the world, and the coasting trade amounts to one-quarter of that of the foreign trade. Exports exceed imports in value on account of the interest on British capital, and the payments for shipping and Government services. The chief exports are raw cotton and cotton in various stages of manufacture, raw jute and jute goods, rice, hides, skins, tea, oil-seeds, opium, wheat and wheat flour, lac, oils, rubber, coffee, manganese ore, tobacco, wool, and indigo; and the chief imports are textiles (mainly cotton goods), iron and steel goods, machinery, sugar, coal, woollen goods, provisions, clothing railway material, silk goods, petroleum, liquors, and motor vehicles. Most trade is with the United Kingdom (predominant), France, Germany, Italy, Belgium, Holland, China, Japan, the Dutch East Indies, Persia, Eastern Africa, the United States, and Australia.

Trade Centres. The chief towns are: *Delhi City* (366,000), proclaimed the capital of India in 1911; *Calcutta* (1,132,000), the second city and chief port; *Bombay* (1,158,000), the first city, and the Liverpool and Manchester of India; *Madras* (647,000), the third port; *Hyderabad* (405,000), an important Mohammedan centre; *Rangoon* (400,000), the chief port of Burma; *Lucknow* (275,000), "India's garden city"; *Lahore* (430,000), the capital of the Punjab; *Ahmedábád* (274,000), a cotton manufacturing centre; *Benares* (205,000), the sacred city of the Hindus; *Bangalore* (238,000), a military centre; *Agra* (230,000), noted for the Taj Mahal; *Cawnpore* (244,000), the "Manchester of Upper India"; *Allahábád* (184,000), a great cotton and corn market; *Poona* (163,000), a military centre; *Amritsar* (265,000), a textile centre; *Karáchi* (261,000), the port and gate of the Indus basin; *Mandalay* (149,000), the chief city of Upper Burma; *Trichinopoli* (120,000), a railway centre; *Patna* (120,000), a rice centre; *Dacca* (120,000) a jute centre; *Peshawar* (105,000), a frontier garrison town and fort; and *Srinagar* (142,000), the capital of Kashmir.

Mails and Time. Mails are dispatched from Great Britain to India every Friday night. The time of transit is to Bombay 14 days, to Calcutta and Madras 16 days each, to Rangoon 18 days.

The time of India is 5½ hours in advance of Greenwich time.

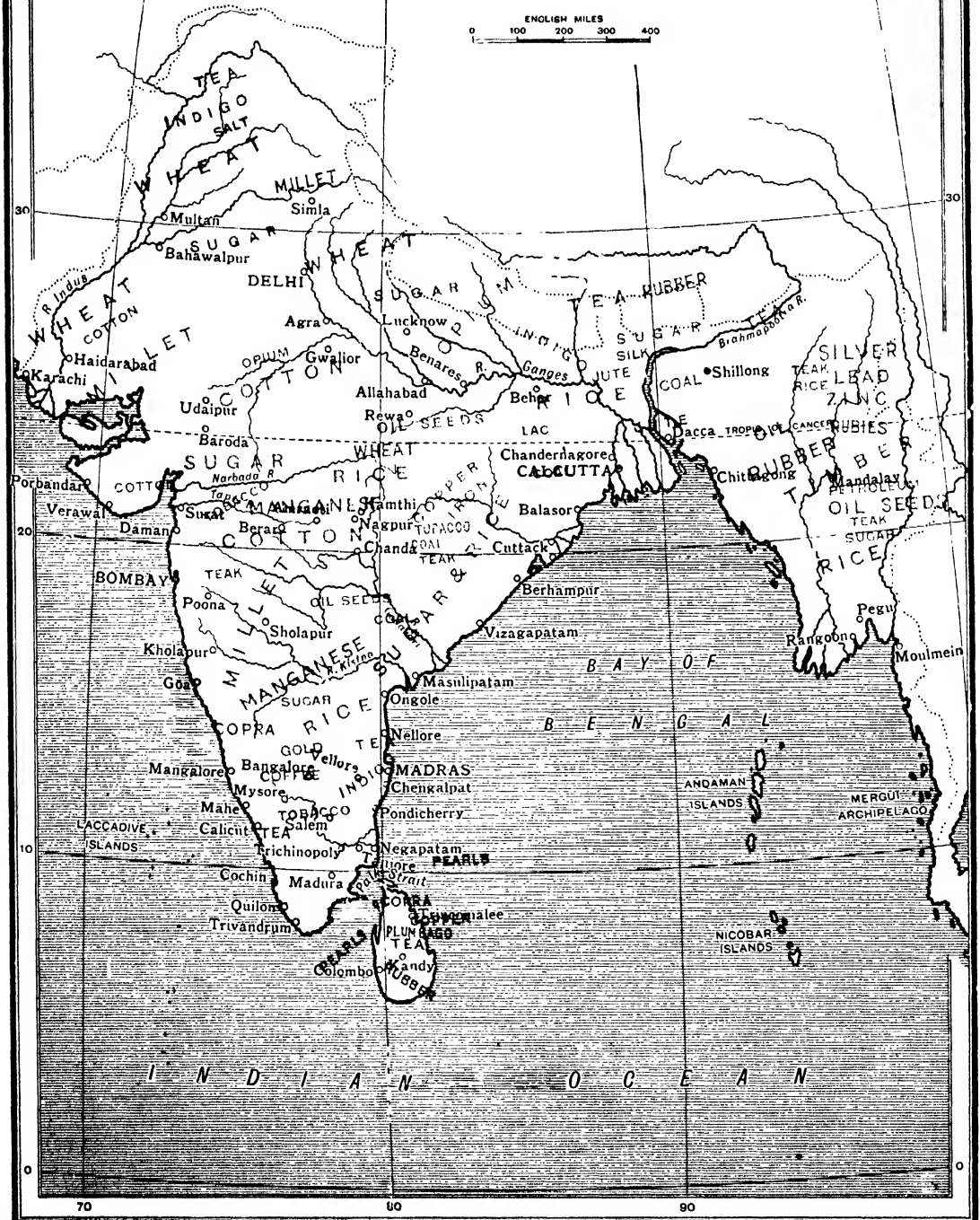
The possessions held by foreign powers in India are: (1) by the French, Pondicherry, Chandernagore, Karikal, Yanaon, and Mahé; (2) by the Portuguese, Goa, Damão, and Diu.

CEYLON

The British Crown Colony of Ceylon (25,332 square miles; 5,313,000 population) is a pear-shaped island,

PRODUCT MAP OF THE INDIAN EMPIRE

0 100 200 300 400
ENGLISH MILES



a detached fragment of India, from which it is separated by the Gulf of Manar and Palk Strait. From the low coastal strips, which widen in the north and north-east, the land rises to the circular mountain plateau of the centre, which attains 8,300 ft. in Pedrotalagalla, and 7,400 ft. in the famous Adam's Peak. The climate is tropical, but comparatively healthy, except in the low-lying districts. Most of the inhabitants are engaged in agriculture. One-sixth of the world's tea is grown, mainly on the central plateau. Rubber is being produced in increasing quantities in the valley of the Kelani-ganga, in Kalutara, and in the Matale district. European capital is employed in the cultivation of the coconut palm, and the desiccation of the kernel for confectionery. Other agricultural

products are cinnamon, cinchona, cacao, rice, tobacco, spices, luscious tropical fruits, vanilla, and areca nuts. Cattle are the chief animals reared, and are largely used for draught purposes. Plumbago is important, though the output has recently decreased. Ceylon is a land of jewels. Sapphires, rubies, amethysts, moonstones, beryls, garnets, cats'-eyes, and tourmalines are found. The pearl fisheries in the Gulf of Manar were once renowned throughout the world, but the yield now is disappointing. Very valuable timber, including ebony, mahogany, satinwood, tamarind, and bamboo, is found in the forests. The chief towns are: *Colombo* (284,000), the capital; *Galle* (39,000), a southern port; *Kandy* (37,000), the old Sinhalese capital; and *Trincomali*, a port.

Position, Area, and Population. China, the "Flowery Land," is a huge, triangular country, which, after a long career as a monarchy and an empire, became a republic in 1912. Its history dates back to 2852 B.C., and its people are a complex of cognate type, Mongoloid at base, whose unification has been proceeding with many and serious breaks throughout the centuries. Chinese civilization is old, but differs from that of the West in its lesser breadth and depth, a result of centuries of isolation from other progressive influences. "Westernization" of the country through commerce, railways, and missionaries is spreading apace, and Chinese students, foreign-trained, are leading the way in criticism and in constructive work. There are many difficulties to be overcome—the creation of a spirit of patriotism; the establishment of a strong government, just laws, and administration; and the displacement of the prevailing cult of hatred of the foreigner by the happier and more profitable cult of goodwill. Signs are not wanting that these difficulties will be overcome, and China will gain an assured position among the Powers.

The Republic lies between 18° and 53° N. Lat. and between 72° and 132° E. Long., and is bounded on the north and west by Asiatic Soviet Russia, on the south by India, Burma, and French Indo-China, and on the east by the Pacific Ocean. It comprises the eighteen provinces of China Proper (1,534,420 square miles; 412,000,000 population); Manchuria (363,610 square miles; 22,100,000 population); Sinkiang (550,340 square miles; 2,500,000 population); Mongolia (1,875,000 square miles; 750,000 population); and Tibet (463,200 square miles; 2,000,000 population). The last three regions enjoy a large degree of self-government under supposed Chinese overlordship. Manchuria is nominally Chinese, but lies within the economic sphere of Japan, which dominates the railways; and Mongolia is in alliance with Soviet Russia.

Coast Line. The coast (2,500 miles) is washed by seas of the Pacific Ocean, known locally as the Yellow, East China, and South China Seas, all of which are shallow. There are no good harbours on the sandy shores of the Gulf of Pe-chi-li; but on the rocky coasts of the Shantung peninsula, Chifu, Wei-hai-wei, and Kiaochau are good ports. South of the Yang-tse-Kiang, the coast is much indented, and contains many excellent harbours. Shanghai, Canton, and Victoria (Hong Kong) carry on a large trade both with the interior and with foreign countries.

Relief. As a whole, China is a plateau higher in the south than in the centre and north-east. It is composed of: (1) the two extensive plains in the north-east of China Proper; (2) the mountainous and hilly country in the west and south-west of China Proper, and the mountainous Shantung Peninsula; (3) the huge steppe-land of Manchuria on the north-east; (4) the parched and dreary tableland of Mongolia on the north-east; (5) the vast plateau of Sin-Kiang (Chinese Turkestan), including Kashgaria in the south, and Zungaria in the north; and (6) the lofty, desolate, lake-strewn, mountain-ribbed plateau of Tibet, "a tableland with the table legs in the air."

In the west and south, the mountainous country consists of an intricate system of mountain chains and spurs, which in the south run generally east and

west, rising to their greatest height in the Yunnan plateau, and sinking to their lowest level in the Hunan lake district. The Nan-Shan or Nanling Mountains, forming the main ridge, separate the Yang-tse-Kiang basin from that of the Si-Kiang. On the west, the Peling Mountains, a continuation of the Kwen Lun, divide the Hoang-Ho basin from the Yang-tse basin, and form a serious barrier to communication between the north and south. The lofty Nan-Shan Mountains, rising to heights of approximately 20,000 ft., form the boundary between China Proper and Tibet; while the Great Wall (1,400 miles), one of the wonders of the world, stretches from the Gulf of Pe-chi-li into the desert wastes of Turkestan.

Three great rivers cross China from west to east. The Hoang-Ho or Yellow River (2,600 miles) rises in Tibet, crosses the fertile loess basin of Northern China, and finally pours its waters and vast quantities of sediment into the Gulf of Pe-chi-li, which it is gradually silting up. Obstructed by shallows and waterfalls, liable to burst its banks and change its course, thereby causing at times great loss of life and property, and with a rapid current, the Hoang-Ho is of very limited use to commerce. The Yang-tse-Kiang or Blue River (3,000 miles) also rises in Tibet, flows through the fertile Red basin, and after passing through a series of gigantic gorges has a navigable course of over 1,000 miles to the sea. The Si-Kiang or West River (1,200 miles) is the chief waterway of Southern China, and is navigable, more or less, for the greater part of its course.

Manchuria is largely a huge grassy plain, though it contains a dreary saline tract in the south. It is bounded on the west by the Khingan Mountains, on the north by the Amur River, and on the east by the Ussuri. In the north the valleys of the Sungari, Nonni, and Ussuri are rich.

The vast plateau of Mongolia is largely occupied by the vast "sea of sand," known as the Gobi or Shamo, whose altitude is over 3,000 ft. Poor steppe land and a few fertile and well-watered valleys in the north-west make up the remainder of the region. The chief settlements are in the north, where extensive spurs of the Altai, Tian Shan, Sayan, and Yablonoi Mountains traverse the country.

Sin-Kiang is divided naturally into two unequal portions by the Tian Shan range. Kashgaria, the larger section, is largely the basin of the Tarim River, which empties itself into Lake Lob Nor. Most of it is a desert of shifting sand, whose advance in the course of ages has overwhelmed ancient prosperous cities. The population is mainly settled in irrigated areas on the river banks at the base of the Kwenlun, Altyn Tagh, the Tian Shan, and the Pamirs. Between the Tian Shan and the Altai lies the lower plateau of Zungaria, whose rivers disappear in lakes and marshes.

The lofty, wind-swept, thinly-inhabited plateau of Tibet stretches through about twelve degrees of latitude between the Himalayas and the Kwen-lun, Altyn Tagh, and Nan-shan. Its extensive mountain-crossed high plains have an elevation of 14,000 ft. to 17,000 ft. in the west, and from 9,000 ft. to 14,000 ft. in the north-east. In the east, the parallel ranges, trending east and south, are separated by inaccessible and unexplored gorges, containing the head-streams of the Mekong, Yang-tse and Hoang-Ho. The Indus and the Brahmaputra

or Sanpo rise near each other, flow in opposite directions, and after courses of several hundred miles break through the bounding parallel ranges of Tibet in inaccessible gorges to the plains of India. Most of the inhabitants live in the southern Sanpo and adjoining valleys.

Climate and Soils. Over such a vast region as China many varieties of climate are experienced, ranging from extreme continental to sub-tropical, and from humid to extreme arid. Generally speaking, the whole region is subject to extremes of temperature, hot summers alternating with cold winters. Naturally, the greatest ranges of temperature occur in the north and west. Summer rains, brought by the south-east monsoon, are characteristic, and all the eastern regions, and especially the south-east, receive a copious summer rainfall (Hong Kong, 85 in.; Tientsin, 18 in.). Passing from the coast into the interior, the rainfall diminishes, and the western plateaux are almost rainless. The lower Sanpo valley receives a small rainfall from the Indian south-west monsoon. Dry, cold winters, following the warm summers, tend to maintain the health and energy of the inhabitants. Peking (January, 23° F.; July, 79° F.) and Hankow (January, 38° F.; July, 83° F.) illustrate well the great variations between summer and winter temperatures. Manchuria has a very severe winter, the ground being frozen for four months, and the thermometer sinking several degrees below zero.

The northern half of China Proper is covered with a peculiar yellow soil, known as loess, which has been derived from the arid plateaux of the west. It is a remarkably fertile soil, easy to work, exceedingly porous, and rewards cultivation even at great altitudes. In some places the loess is 2,000 ft. deep, and roads and rivers cut deep down into it, rendering communication difficult and irrigation impossible. In Central China, especially in the east of Szechwan and the north of Yunnan, there is situated the "Red Earth" region, covered with a very fertile soil, formed by the weathering of an old red sandstone. The alluvial soils of the great rivers are rich, those round the Gulf of Pe-chi-li being specially noteworthy.

Land and Water Communications. Few roads are fit for cart traffic in the south, the wheelbarrow being the chief vehicle. In the north cart traffic is more common, but heavy charges limit the amount of traffic in bulky commodities. Water is the most important means of communication, and the Yangtse is unrivalled in the world in the length of navigation it affords for ocean steamers through a densely peopled region. Hankow (700 miles up the river) can accommodate steamers loading up to 30 ft. during the high-water season (April to November); but during the low-water season it can be reached only by river steamers drawing 10 ft., and lighterage has to be effected. Light draught steamers can reach Suifu, 1,610 miles up the Yangtse, and river steamers of 600 tons can reach Ichang, 1,000 miles from the sea. The Si-Kiang is navigable for small vessels as far as Wuchow, and small boats continue the navigation almost to the frontier. In the north the Pei-ho and its tributaries are important, but the Hoang-Ho can be navigated only by small boats, owing to rapids and shallows. Human porters and pack animals are the chief means of transport where boats cannot be used, and where railways are lacking. The canal system shows high

development, and in the Grand or Imperial Canal China possesses the largest canal in the world (700 miles). This important waterway runs from Hangchow to Tientsin, uniting the lower Yangtse and Hoang-Ho rivers. Much of it has fallen into bad repair, but its southern section still forms a fine navigable waterway for boats of 5 ft. draught and over. It is estimated that China requires 50,000 miles of railway to handle its imperative transportation requirements; but little more than 10,000 miles are in its possession. Practically all the existing railways have been constructed with foreign capital; though, with a few exceptions (notably the Japanese South Manchurian Railway, the French Yunnan Railway, and the Russo-Chinese Eastern Railway), all are under the nominal control of the Chinese Government. Peking is connected with Tientsin and Hankow; with Suiyuan *via* Kalgan and Fengchen; and with the Trans-Siberian line by the Manchurian railways. Short lines connect Shanghai with Wusung, Nanking, and Hangchow; Kiaochau with Tsinan; Tientsin with Pukow; and Wuchang with Yochow. The Hankow to Canton line is partially completed.

Productions and Industries. *Agriculture.* China is essentially an agricultural country, and farming is held in high esteem. The land is all freehold, and is held by families on the payment of an annual tax. Great density of population results in small holdings and intensive cultivation (spade culture). Farm implements are primitive, and irrigation is common. Horticulture is a growing industry, and fruits are grown in great variety, including the persimmon, guava, mango, pomeloe, mulberry, loquat, and li-chu. Wheat, barley, maize, millet (the staple food of the poorer classes), peas, and beans are chiefly cultivated in the north. Rice (the staple food of the upper and middle classes), sugar (cane), indigo, cotton, tobacco, tea, and silk are produced in the central and southern zones. Tea is grown on the hill slopes, especially in the maritime provinces. In the west and south, Fu-Kien, Hupe, Kiang-hai, Hunan, Cheh-Kiang, Nganhwai, Kwangtung, and Szechwan are important tea districts. Most of the tea is grown on small family allotments. China has long been noted for its silk, much of which is exported to America. Though the mulberry tree grows over a wide range, the best and largest quantities of silk come from Kwangtung, Szechwan, Kiang-su, and Cheh-Kiang. Rice is not grown north of the Tsingling Mountains, and cotton is mainly confined to the basin of the middle and lower Yangtse. China ranks third in the cotton-producing countries of the world. Opium, once widely grown in the north and west, is rapidly decreasing owing to the prohibition placed on opium smoking. Kansu is noted for its excellent tobacco; the Sangle hills and the Hankow and Bohea districts for their famous teas; Hunan for its medicinal plants and sesamum seed; Manchuria for its wheat, rhubarb, and ginseng; and Fukien for its camphor. Manchuria and the Yangtse valley are the centres of the soya-bean industry. Soya-bean oil (used largely in cooking in the Far East), and beans and bean cake, now occupy the second place among China's exports. Barley, wheat, and peas are grown in limited quantities in Tibet, and cotton and rice on the fertile oases of the west. An interesting sight on the rivers is the floating poultry farms.



The Pastoral Industry. The pastoral industry is not of great importance. In Central China there is little space for pasture. On the steppe lands of the west, cattle, sheep, horses, and camels are reared, and pigs and poultry are found everywhere. Cattle are important in Shantung, and there is a freezing plant at Tsing-tao. In Tibet, yaks, sheep, and goats occur, both wild and domesticated. Pigs feed in the great forests of the north, and wild asses roam on the southern mountains of Kashgaria. Manchuria is noted for its dogs, whose skins form an important export.

Fishing. The fisheries of both the sea and inland waters are very prolific. It is said that about 40,000,000 Chinamen live by fishing, working day and night, and employing every kind of line and net, and trick and snare in catching the fish.

Forestry. China is not rich in forest lands, though extensive forests are still found in the north, and lumbering is a winter industry in Manchuria, whose forests contain pine, oak, and elm. The bamboo is everywhere important, but especially in the south. Characteristic trees are the wax tree, the paper mulberry, cassia, the sweet orange, and the camphor. The southern forests supply camphor, spices, wax, and lac.

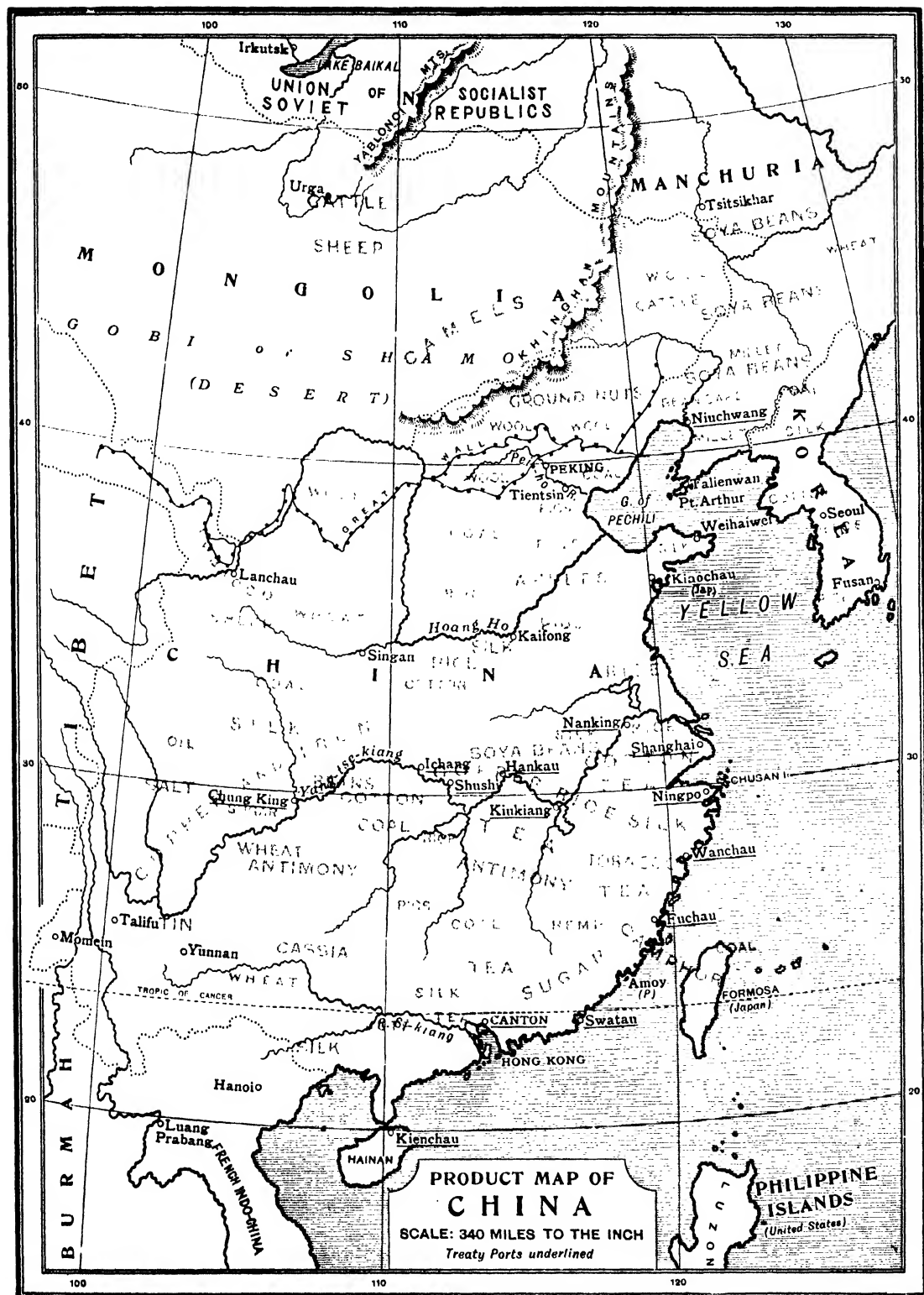
Mining. Mining by crude methods has been carried on since very ancient times, and, apart from foreign-owned mines, is still largely of the pick and shovel type. The mineral wealth is very great, but is little developed. Modern methods of mining are practically confined to coal and iron, which are the chief mineral products. The coal reserves are estimated at 1,000,000 million tons. There are coal deposits in every province of China Proper, and in Manchuria. The coal mines of Kaiping, Northern Chihli, are very productive, and likewise those of Poshan in Shantung. Peking is supplied with anthracite fuel from the mines of Fangshen-Hsien. Eastern Shansi possesses a field of anthracite (13,500 square miles), and Western Shansi a field of bituminous coal nearly as great. In South-eastern Hunan the coal area (21,700 square miles) contains both anthracite and bituminous coal. Coal for steam purposes is abundant in Central and Northern Szechwan. As yet, the annual production of coal does not exceed 20,000,000 tons. The iron reserve is estimated at 677,000,000 tons. In Shansi the iron industry is aided by the abundant coal. Iron is also mined in Manchuria and West Chihli (annual production, 1,500,000 tons). Over 60 per cent of the world's antimony is accredited to China, and the Republic ranks after Malaya and Bolivia in tin production (10,000 tons annually). Petroleum is worked on the Upper Yang-tse; copper in Yunnan; tin, lead, and silver near Mengtse; antimony in Hunan; tin and gold in Hainan; limestone and potter's clay in Shensi; salt (a Government monopoly) in Yunnan and Szechwan; gold in Manchuria; and jade in Chinese Turkestan. Among other minerals found in considerable quantities are manganese, tungsten, mercury, orpiment, asbestos, nickel, mica, and molybdenum.

Manufactures. Manufactures of the domestic type are of great antiquity. Silk, cotton, and rhea fibre are worked up by women either at home or in small establishments. In the manufacture of china (at King-te-chen), porcelain, fans, lacquered ware, gongs, card-cases, and antique bronzes, and in gold

and silver filigree work, and ivory carvings, the Chinese exhibit wonderful skill in planning and great patience in production. The modern industrial system with its huge factories has begun its development in China, but, as yet, with conditions of long hours, female and child labour, and often unhygienic surroundings. The principal manufactures are cotton spinning and weaving (chiefly low counts), flour-milling, sugar, cigarettes, vegetable oils, ship-building (at Hong Kong and Shanghai), printing, match-making, soap, silk filatures, lace, and hair nets. European influence is seen in the erection of cotton mills at Shanghai, Hangchow, Ningpo, and Wenchau, and of filatures for winding silk from cocoons at Shanghai and Canton. Soap factories are established at Nanking, and at the large centres flour and rice mills are beginning to supersede the native methods of treating rice and wheat. Hanyang, near Hankow, has large ironworks, supplied with ore from the Ta-yeh mines. It is safe to say that the wonderful potentialities in China's water-power will, ere long, be utilized in manufacturing. China is destined to become a very serious competitor of Europe in manufactures, supplying its own wants and competing in the world markets.

Commerce. Most of the commerce of China is internal, and its foreign trade is almost wholly conducted at certain treaty ports, where foreign merchants may reside and own property, and where ships are allowed to land and discharge cargoes. Of these, there are upwards of thirty, including all the chief seaports and most of the river ports. Shanghai and Canton are the busiest treaty ports, and the fortified British possession of Hong Kong is a most important commercial gateway to China, a considerable proportion of the imports and exports passing through it. Most of the foreign trade is with the United Kingdom, the British Dominions, the United States, Japan, Belgium, and France. Overland trade with Siam and Burma passes through Tali-fu; with Tibet through Chengtu; with Central Asia through Langchow; and with Mongolia and Southern Siberia through Peking. The chief exports are oils, oil cake, raw silk and silk products, textiles (the finer qualities of silks and laces), tin, cereals, tea, sugar, straw, skins, hides, pottery, furs, tallow, wool bristles, eggs, peas, beans, hair, paper, mats and matting, and bamboo-ware; and the chief imports are cotton goods, hardware, machinery, machine tools, shipbuilding material, tobacco, metals, railway material, opium, petroleum, rice, sugar, coal, woollen goods, timber, leather, matches, gunny bags, and fish. An extensive coasting trade is carried on by British and foreign steamers as well as Chinese steamers and junks.

Trade Centres. Although there are no reliable statistics of population available, at least twenty towns have populations exceeding 100,000. The chief towns are: *Shanghai* (1,600,000), the busiest treaty port; *Hankow-Wuchang-Hanyang* (1,500,000), the great tea and silk port; *Canton* (1,400,000), the most important southern treaty port; *Peking* (1,298,000), the former capital; *Fuchow* (900,000), a silk centre; *Tientsin* (850,000), the port of Peking; *Hangchow* (730,000), a treaty port; *Nanking* (600,000), the present capital; *Singan* (600,000), the capital of Shansi; *Chungking* (600,000), the chief river port of Szechwan; *Suchow* (600,000), a silk market; *Changsha* (500,000), a mining centre; and *Amoy*



(400,000), a tea port. In Manchuria the chief town is *Mukden* (250,000), the capital; in Mongolia, *Urga* (100,000), the capital; in Sin-Kiang, *Urumchi* (15,000), the capital; in Chinese Turkestan, *Kashgar* (50,000), the capital; and in Tibet *Lhasa* (15,000), the capital.

Foreign Possessions in China. Great Britain holds Hong Kong and the Kowloon Territory; France, Kwang-chaw-wan; Portugal, Macao; Japan, Port Arthur and Dalny; and Italy, the Tientsin Concession.

Hong Kong, formerly belonging to China, is an island in the Canton estuary. With the peninsula of Kowloon on the mainland and a leased territory in Kwantung Province, the Crown Colony has an area of 391 square miles, and its population numbers about 1,100,000, 96 per cent of whom are Chinese. Its splendid harbour is a naval station, and the island has a strong garrison of Sepoy and British

regiments. Hong Kong is one of the greatest coaling stations in the world, and has steamship communication with Europe, Australia, and the United States. Owing to its excellent situation, it commands the foreign commerce of Southern China, the actual export trade of the settlement being many millions sterling annually. The great articles of export are tea, rice, camphor, and silk; of import, cotton goods, oils, coal, iron, and steel. Victoria (450,000) is the capital.

Mails and Time. Mails are dispatched to China several times a week. Peiping (Peking) is 11,770 miles distant from London. The time of transit *via* the Siberian Railway is about 14 days; *via* the Suez Canal, 39 days. To Shanghai the time is about 18 days *via* the Siberian Railway, 27 days *via* Vancouver, and 32 days *via* Brindisi.

The time of the eastern part of China is eight hours in advance of Greenwich time.

Position, Area, and Population. The ancient and extensive Japanese Empire, the "Britain of the East," a land of earthquake, fire, and unstable foundation, which, since 1868, has moved out of the Middle Ages into the position of a Great Power, covers an area of 265,129 square miles and supports a population of approximately 91,000,000. Largely a crescent-shaped chain of volcanic islands along the east coast of Asia, it stretches from the northern Kuriles to the southern end of Formosa. Japan proper (145,024 square miles; 64,450,000 population) consists of a main island, Honshu, and three other large islands (Shikoku, Kiushiu, and Hokkaido) in sight of the main island, and some 4,000 islets. Learned opinion asserts that the Japanese are the fusion of two or three different tides of Tartaro-Mongolian immigration, which flowed to Japan by way of Korea. There is probably also an admixture of Malay, but the Mongol type is predominant. Enterprise, intelligence, politeness, appreciation of natural beauty, patience, patriotism, and filial piety are Japanese characteristics.

Coast Line. Owing to its island character, the coast line of Japan is very extensive, and the peculiar formation of the country provides it with a large number of splendid harbours, deep and safe.

Relief. With the exception of Korea, the Japanese Empire and its island fescos lie in the great seismic line that borders the Pacific. The mountain systems of the main islands occupy most of their area; only in southern Hokkaido and in eastern Honshu are there any extensive lowlands, where swift-flowing rivers have spread abroad a rich volcanic, deltaic deposit. Japan has over 200 volcanoes (over 50 more or less active), about 1,000 hot springs, some two dozen mountains between 8,000 ft. and 12,000 ft. high, and four (more or less) perceptible earthquakes a day. Fortunately, earthquake shocks of the magnitude of those which laid Tokio in ruins in 1923 are not frequent. The chief volcanic mountain systems are the Kurile Chain; the Nasu Chain, stretching through Hokkaido to the active Asamayama (over 8,000 ft.) in Honshu; the Choaki Chain; the Fuji Chain containing the sacred Fujisan (12,395 ft.); the Aso Chain; the Haku-San; and the Kirishima Chain. Two distinct chains, separated by a rift valley, traverse northern Honshu from north to south. In Southern Honshu two ranges of the Kuenlun system run from south-west to north-east, the northern one forming the long, narrow continuation of Western Honshu, the other the islands of Shikoku and Kiushiu. Between them is the deep depression occupied by the Inland Sea (1,325 square miles). The Karafuto system in Karafuto and Hokkaido, with its sunken portion in Tsugaru Strait, is continued in the Kuriles. The rivers are short, swift, frequently interrupted by rapids, shallow in the dry season, subject to destructive flooding in the wet season, and almost useless for navigation. They are, however, valuable for the transport of timber, the irrigating of the rice-fields, and for hydro-electric schemes. The chief are the Shinano, Tone, and Kiso in Honshu, and the Ishikari (about 400 miles) in Hokkaido. There are many lakes, some of surpassing beauty, such as the Hakone and the Biwa.

Climate and Vegetation. Stretching through 29 degrees of latitude, Japan, though mainly insular in character, has many climates, ranging from the

tropical heat of Formosa to the Arctic conditions of the northern islands. The foggy Kuriles and Karafuto have an average annual temperature of about 35° F.; Yezo has 44° F.; the Tokio region 57° F.; the Shimonoseki region 59° F.; and Formosa over 70° F. There are two wet seasons—from the middle of June to the beginning of July, and the beginning of September to early October—and the rainfall is heavy, averaging for all Japan 62 in. per year. The wet summer monsoon from the south-east blows across the warm Kuro Siwo, bringing heavy rains to the southern and eastern sides of the islands, especially in June. In winter, the monsoons from the north-west draw moisture from the Japan Sea and deposit it as rain or snow on the western and northern parts of the main island. The temperature of the west is lowered by winds blowing over the cold Behring current. Typhoons, peculiar to the Japan and China seas, frequently cause damage in the south.

Nearly one-half of Japan is forest-covered. The forests include trees of cool temperate type like the conifers of Karafuto and Northern Korea; temperate deciduous trees of the main islands—oak, alder, box, and maple—and tropical types like the camphor trees and bamboos of Southern Japan and Formosa. Pasture is scarce, and consequently the pastoral industry is on a small scale. Forests grow large, but with the exception of the orange and persimmon they have a poor flavour. Many are cultivated for their blooms, chief of which are the plum, cherry, and peach. The Japanese are skilled gardeners, delighting in fantastic shapes, miniature landscape gardens, and gorgeous flowers.

Communications. There are 10,000 miles of railway. Steep gradients and circuitous routes are characteristic of the railway system. The road system is defective, and reliance is placed on the railways. Outlying districts are reached by coasting vessels and by road; and there are ferry systems between the islands, especially across the Inland Sea. The merchant fleet totals 4,500,000 gross registered tons, the principal liner companies engaged in the foreign trade being the Nippon Yusen Kaisha, the Osaka Shosen Kaisha, and the Tokio Kisen Kaisha.

Productions and Industries. *Agriculture* has long been the chief occupation of the people. There are practically no large landed proprietors, and the striking feature is the tillage of small holdings in which every member of the family shares. Only about 12 per cent of the whole area of Japan is cultivable, but by the most careful system of subsoil working, manuring, terracing, and irrigation, together with a favourable climate, the industrious peasant farmers often raise two crops a year from the same ground. The chief crops are (figures in million acres): rice (8.0), wheat (1.25), barley (1.26), rye (1.6), tea (0.12), tobacco (0.1), and silk (1.25). Rice is mainly grown in well-irrigated fields. The annual production is about 300,000,000 bushels, and a considerable amount has to be imported from Burma, Cochin-China, and China. Mulberries are planted in more than three-fourths of the provinces, everywhere in rows, allowing of space for other crops between; and Japan produces 40 per cent of the world's silk. Tea, the national beverage, is cultivated mainly on the well-drained slopes in Honshu, Kiushiu, Shikoku, and Formosa. Japan proper

produces green tea; Formosa the famous black, peach-scented Oolong tea. Among tea-exporting countries Japan ranks fourth, some 50,000,000 lb. being exported annually to Canada and the United States. Barley, rye, and wheat are northern summer crops, and follow rice as winter crops in the south. Other food crops are millet, buckwheat, maize, sorghum, soya beans, red beans, broad beans, peas, potatoes, sweet potatoes, and the giant radish (*daikon*). There are heavy imports of soya beans from Manchuria. Tobacco, a Government monopoly, is successfully grown as far north as Yezo, but thrives best in Southern Honshu. "Mandarin" oranges and golden persimmons are important in the south; and apples, pears, strawberries, figs, and grapes are being grown in increasing quantities. Rape-seed is cultivated for oil; hemp for thread; the paper-mulberry for soft Japanese paper; the lacquer tree for lacquering material; the camphor laurel for camphor and camphor oil; and the sugar-cane is grown in the warm south and in Formosa.

The Pastoral Industry. Japanese agriculture leaves little room for live stock. There are 3,900,000 cattle; 1,600,000 horses; 1,470,000 oxen; 668,000 pigs; 151,000 goats; and a few thousand sheep. Milk, butter, cheese, and leather are very limited in quantity, and the almost complete absence of home-grown wool compels imports of that commodity and the making of winter clothes padded with cotton.

Fishing. One of the main staples of the Japanese diet is fish, and the fisheries rank next to agriculture. Plentiful food, brought by the ocean currents, and differences of temperature in the waters encourage a rich and varied fish life. It is said that nearly a million Japanese have fishing as their sole occupation. The chief fishing grounds are in the shallow seas bordering the coasts of Yezo, but the occupation is widespread along most of the coasts, and ranges from the Sea of Okhotsk to Australia. The chief fish caught are the bonito, cuttle, mackerel, sole, cod, mullet, eel, salmon, sardine, tunny, herring, tai, and maguro.

Mining. The mining industry is important. Coal, mined principally in Kiushiu behind the port of Nagasaki, in Yezo at Ishikari, and in Northern Honshu near Fukushima, reaches an annual output of 32,000,000 tons. Copper, ranking next in importance to coal, comes chiefly from the rich mines of Yezo, Honshu, and Shikoku. The most famous mines are the Ashio, the Kunitomi, and the Besshi. Very few iron mines exist (annual production less than 500,000 tons), and rarely near coal. Practically all supplies are imported, chiefly from China, where Japan has financial control over iron mines. Japan imports the bulk of its petroleum from America, and is greatly concerned over the inadequacy of the home supplies, which are obtained in Central Honshu, near Niigata, at Akita, farther north, and in Formosa. Gold is mined at Sado, Mito, and Akita in Honshu, and near Kagoshima in Kiushiu. Silver is obtained chiefly from the Tsubaki mine in Honshu. In the island of Rasa, east of Formosa, is one of the richest deposits of phosphates in the world. Other minerals are sulphur (£3,000,000, annual production) from the volcanic regions, kaolin in the Nagoya region, antimony, mercury, lead, zinc, asphalt, tungsten, molybdenum, manganese, and agate.

Manufactures. Japan's rise as an industrial power is without precedent in modern history. Its industrial growth, which has taken place within the past sixty years, and particularly during the last two decades, has been phenomenal, partially solving the problem of the pressure of population on its small productive area. Several factors made this rapid industrial growth possible: long hours, low wages, abundant labour (though relatively inefficient), favourable geographical position in relation to the Far Eastern markets, the adoption of the methods of the leading industrial nations of the world, Government initiative and help, and the effects of the European War. To-day, Japan has to face keener competition, higher costs of living and wages, and organized labour. To meet these, Japan is endeavouring to reduce its production costs by increasing its labour efficiency, utilizing semi-automatic machinery, improving its industrial organization, and promoting scientific research. Probably no country in the world is converting potential water-power into electrical energy so rapidly as Japan.

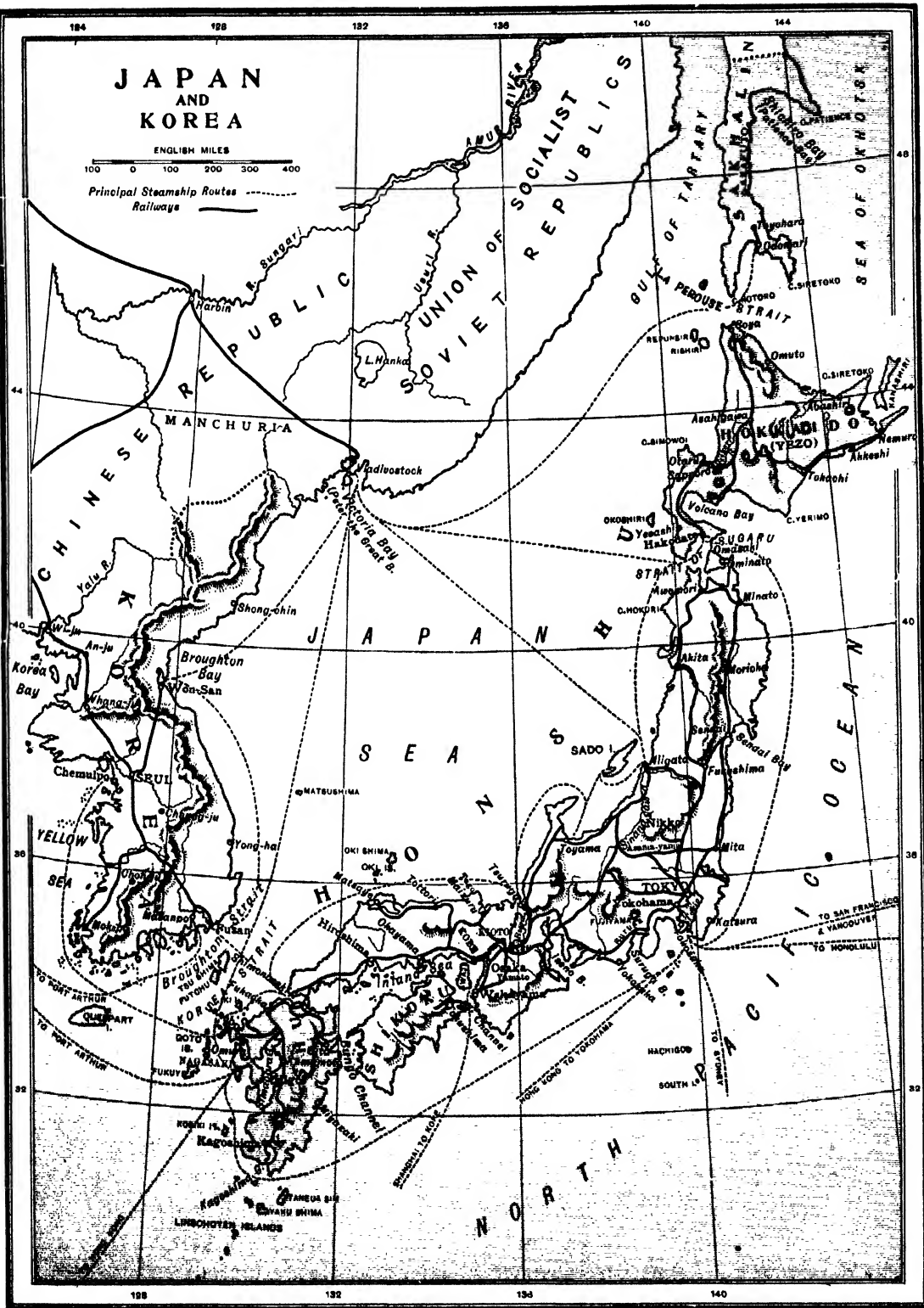
About 1,500,000 people are engaged in manufacturing industries. The manufacture of silk yarn and silk piece-goods, once the premier industry, has been outstripped by the cotton industry, which employs over sixty important companies. Electric power and a moist climate for spinning favour the textile industries, a striking feature of which is the large number of women and children employed. Every large centre spins silk, but the chief flatures and spinning mills are in the prefectures of Nagano and Gumma. Osaka, the "Manchester of the East," is the centre of the cotton industry, and Kobe and Nagoya have important cotton mills. Woollen goods are manufactured at Osaka and other centres, but there are large imports of woollen goods and yarn from Europe. Iron and steel works are at Wakamatsu, Yawata, Kure, Osaka, and Muroran. Ship-building is on a large scale at Nagasaki and Kobe. Paper-making (European and Japanese style) is carried on chiefly in the provinces of Suruga and Totomi, and in the Sapporo district. Lacquer-ware, earthenware, and porcelain industries flourish at Aichi, Kyoto, Arita, and Kagoshima. Most widely spread are the industries dependent on agriculture. There are numerous rice-mills; distilleries for producing saké from rice; and breweries, flour-mills, and oil-mills. Other manufactures are toys, fancy goods, matches, soap, matting, rubber, glassware, carpets, chemicals, sugar, embroidery, metal-engraving, wood-carving, bronzes, and fish-canning. The indigenous manufactured products, such as the exquisite tissues, porcelains, fans, ivory carving, and bronzes have deteriorated in quality. Kyoto, however, still produces excellent specimens of modern craftsmanship.

Commerce. Most trade is carried on with India, China, Germany, Great Britain, the United States, Belgium, Sweden, Siam, Australia, New Zealand, France, Denmark, Holland, the East Indies, South Africa, and South America. The chief exports are silk and silk manufactures, cotton yarn and manufactures, tea, copper, coal, matches, porcelain, earthenware, lacquer-ware, carpets, straw-plait, camphor, zinc, peas, refined sugar, fish, timber, sulphur, and glassware; and the chief imports are raw cotton, iron and steel, rice, wool, and woollen

ENGLISH MILES

100 0 100 200 300 400

Principal Steamship Routes -----
Railways -----



goods, oil cake, engines and boilers, sugar, cotton goods, manures, rails, locomotives, machinery, petroleum, beans, peas, and pulse.

Trade Centres. There are sixty towns with populations exceeding 30,000. The chief are: *Tokio* (2,071,000), the capital, a focus of railways and roads; *Osaka* (2,454,000), the first industrial centre; *Nagoya* (1,007,000), the centre of a great rice-growing region; *Kyoto* (765,000), the spiritual centre; *Kobe* (788,000), the chief import gate; *Yokohama* (620,000), the chief export gate; *Hiroshima* (270,000), an important port and pilgrim centre; *Nagasaki* (204,000), the port with the best natural harbour; and *Hakodate* (198,000), the port of Hokkaido.

Colonies and Dependencies. *Kiao-Chau* is a small area in the eastern portion of Shantung. Its economic products are fruits, beans, eggs, fish, and salt.

Kwantung (538 square miles; 980,000 population), forming the southern part of the Liaotung Peninsula, is leased from China till 1997. The chief products are soya beans, maize, millet, wheat, buckwheat, rice, tobacco, hemp, vegetables, salt, and fish. There are rich iron mines at Anshantien, and productive collieries at Fushun and Yentai (2,500,000 tons). Dairen (131,000), the capital, and Port Arthur (18,000) are the chief towns.

Pacific Islands. The former German South Sea Islands, north of the Equator, were allocated to Japan by the Treaty of Versailles in 1919, and include the *Marianne* (or *Ladrones*), *Caroline*, and *Marshall Islands* (800 square miles; 60,000 natives; 5,000 Japanese). They are important only for copra, sponges, and turtles. The *Pescadores* (50 square miles; 57,000 population) consist of about twelve islands. Mekong is the chief centre. The *Kurile Islands*, extending in a north-westerly direction from Yezo to Kamchatka, are a chain of little known volcanic islands. Shana is the chief trading centre. The *Luchu Islands* (1,500 square miles; 180,000 population) are volcanic and coralline islands, stretching between Kiushiu and Formosa. Sago, lemons, ginger, sugar-cane, sweet potatoes, tobacco, rice, pigs, and scarlet lacquer are the chief economic products. Nafa is the capital and chief

port. *Karafuto* (the island of Sakhalin, south of 50° N. Lat.; 13,934 square miles; 170,000 population) is called "Wave Land" in allusion to its mountainous character. Fish, furs, timber (for matches and wood-pulp), coal, gold, and oil are produced. Shekka, Toyohara, Naibuchi, and Odomari are the trade centres.

Formosa (13,944 square miles; 4,593,000 population; 180,000 Japanese) is a beautiful, plum-shaped island, lying off South-eastern Asia, where the Pacific becomes merged into the China Sea. Rice, sugar, tea, tapioca, areca nuts, tobacco, ground nuts, soya beans, flax, jute, ramie, pineapples, bananas, sweet potatoes, turmeric, sesame, mulberry, indigo, camphor, timber, fish, gold, silver, coal, sulphur, copper, and petroleum are the chief economic products. Taihoku (175,000) is the capital, and Keelung is the chief port.

Korea or Chosen (85,220 square miles; 21,058,000 population), annexed by Japan in 1910, stretches southwards from Manchuria, some 600 miles in length by 135 miles in breadth, with a coast line of 1,940 miles. Most of the peninsula is mountainous; but the western and southern areas are broad and fertile plains watered by the Yalu, Tumen, Taidong, Nak-tong, and Han. Rice, cotton, silk, ginseng, hemp, cereals, soya beans, fruits, fish, coal, gold, silver, iron, copper, lead, and graphite are the chief economic products. Korean craftsmen produce brassware and heavy wooden chests and wardrobes, and the Japanese have opened factories in Fusan, Seoul, Chemulpo, and Chinnampo. Three-quarters of its trade is with Japan. The chief towns are Seoul (298,000), the capital; Chemulpo, the port of Seoul; Ping-Yang (103,000), the oldest city; Fusan (83,000), a port; and Taiku (66,000), an inland centre.

Mails and Time. Mails are dispatched from Great Britain to Japan and Korea by various routes. The time of transit to Tokio, which is about 11,300 miles distant from London, is 14 to 18 days by the Siberian Railway, 23 to 26 days *via* Vancouver, and 36 to 38 days *via* Suez.

Japanese time is nine hours in advance of that of Great Britain.

The East Indies proper, or the Malay Archipelago, embrace all the islands in the south-east of Asia, with the exception of those which belong to China and Japan. North Borneo is British or under British protection; part of the island of Timor is Portuguese; the Philippines belong to the United States; and the remainder are Dutch colonies.

Relief. The islands are divided into two distinct parts by their physical and biological characters. From the Strait of Sunda east to about 118° E. Long. there lies a submarine plateau hardly 50 fathoms deep; while beyond that line, all the way to a bank close to the coast of New Guinea, extends a deep sea with deeper basins. The boundary line between the plateau and the deeper sea, known as Wallace's line, passes through the Strait of Macassar and between Bali and Lombok. To the west of the line the forms of life are the same as, or closely related to, those of the Asiatic continent; while on most of the islands to the east they clearly indicate Australia as the centre from which they spread. This line, therefore, follows the old shore of Asia. With the exception of Celebes, the eastern islands, rising out of deeper water, have formed at various times part of a once greater Australian continent. Celebes, surrounded by very deep seas, is Asiatic in its fauna, and has long been separated from Asia. The archipelago is exceedingly mountainous and extremely volcanic. For the most part the mountains run from north-west to south-east, or from west to east. A chain of cones, some extinct, some dormant, and others active, sweeps in a semicircle round its border from Sumatra eastward to the Philippines. Ancient rocks occur in Sumatra, Borneo, and Celebes, but most of the others are composed mainly of tertiary strata, over which volcanic ejecta are piled to an enormous depth, and form the bulk of the high land. Rivers exist in immense number, but few are navigable.

Climate and Vegetation. The climate is tropical and humid, and the temperature very uniform, the variations being less than 2° F. in the west and 3.5° F. in the east. The mean annual temperature is a little over 80° F. Both the South-West and the North-East Monsoons bring rain, and, as most of the land is south of the Equator, the fall is heaviest in the southern summer months. The air is damp at all seasons, and the archipelago is one of the rainiest regions known, the mean annual fall being over 100 in., except in the north-east of Java, and in Sumbawa and Timor, where South-East Trades constantly prevail, and Australian influence is felt. Apart from Java, which is cultivated to the extent of about 40 per cent, the islands are still largely covered with primeval forests of tropical riot and luxuriance.

Productions and Industries. Sane Dutch methods are steadily exploiting the boundless natural resources. There are about 8,000,000 acres under rice; 5,000,000 under corn and maize; 2,000,000 under cassava; 400,000 under soya bean; 44,000 under sugar-cane; and 250,000 under tobacco. Teak and many useful timbers, camphor, bamboo, and rubber are obtained from the forests. Rice is cultivated on the alluvial flood plains and low coastal lands, where the sago-palm flourishes, especially in the east. Nine-tenths of the world's supply of cinchona bark, and of its derivative, quinine, comes from Java, where the cinchona is grown on the hill

slopes, as well as coffee, tea, sugar, tobacco, and indigo. The growing of coconut palms is common throughout the islands, and copra is an important export. Pepper and many spices so abound in the Moluccas that they are called the Spice Islands. The cultivation of the oil palm is increasing in Sumatra. Buffaloes and cattle feed on the rich savannas of the higher regions, and among the animal products are wild wax, trepang, edible birds' nests, and pearls.

Very extensive discoveries of minerals have been made throughout the islands. Sumatra produces coal, petroleum, lead, copper, and gold; Java produces coal and petroleum; Banka and Billiton produce tin; Celebes and Timor produce gold; Borneo produces antimony, diamonds, and coal; and iron ore is of frequent occurrence. Tin, petroleum, and coal are the principal minerals of commercial importance. Tin mining is carried on almost entirely by Chinese, and the petroleum wells are in the hands of great European companies. Some 2,500,000 tons of crude oil; 1,200,000 tons of coal; and 30,000 tons of tin are produced annually.

Communications and Commerce. There are 3,300 miles of railway in Java, and 950 in Sumatra. A trunk line runs from Batavia to Surabaya. The road system of Java is admirable; but in most of the islands transport is in a very undeveloped state, and jungle tracks often take the place of roads. A regular steamship service is kept up between Holland and Java, and connection with Britain is made by vessels of the Blue Funnel Line.

Most trade is with Holland, Singapore, the United Kingdom, the United States, British India, Japan, China, Australasia, France, Denmark, and Germany. The principal exports are sugar, molasses, rubber, gutta-percha, tobacco, petroleum, tin, copra, tea, kapok, sisal, coffee, tapioca, quinine, pepper, hides, gums, cinchona bark, rice, and indigo; and the chief imports are cotton piece goods and yarns, chemical manures, iron and steel goods, and machinery.

The Dutch East Indies lie between 6° N. Lat. and 11° S. Lat., and 95° and 141° E. Long., and have a total area of about 737,000 square miles and a population of 50,000,000, chiefly Malays, Negritos, and Papuans.

Java and Madura (50,811 square miles; 37,500,000 population). *Java* (49,000 square miles) is the most important, the most fertile, the most highly cultivated, and the most densely populated of the Dutch possessions. No equal area of the globe is so volcanic the whole island being practically covered with the mud thrown out by volcanoes. Batavia (150,000), the capital; Tandjong Priok, a port; and Surabaya (140,000), the port with the best harbour, are the chief towns. *Madura Island* (1,660,000 population) is engaged in cattle-raising and fishing.

Sumatra (163,138 square miles; 6,764,000 population) is largely unexplored. Most of it consists of jungle, sombre, impenetrable, and desolate. Palembang (54,000), the largest and busiest mart; and Padang (41,000), a port, are the chief towns.

The Riau-Lingga Archipelago (12,506 square miles; 237,000 population) are undeveloped islands exporting spices.

Banca (4,549 square miles; 170,000 population)

and *Billiton* (1,873 square miles; 71,000 population) are famous for their tin supplies.

Celebes (72,679 square miles; 3,110,000 population) is largely undeveloped. The Dutch, as yet, have only effectively occupied the Macassar and Minahassa districts. Macassar (20,000) is the capital and chief trading centre.

The Moluccas (50,000 square miles; 750,000 population) lie between Celebes and New Guinea. Their climate favours the growth of cloves, nutmegs, cardamoms, and pepper. Ternate (3,000) is the capital.

The Timor Archipelago (26,410 square miles; 1,169,000 population) is little developed. *Bali* (2,095 square miles; 865,000 population), the most beautiful of all the islands, is exceedingly mountainous. Buleleng is its chief town and port. Lombok (1,977 square miles; 700,000 population) is well cultivated. Ampanam is its port. *Flores* (5,850 square miles; 250,000 population) is largely unexplored. Lantutuka is its capital.

Timor (12,500 square miles; 1,000,000 population) is owned by the Dutch (the smaller western portion, 5,050 square miles; 700,000 population) and the Portuguese (the northern portion, 7,450 square miles; 300,000 population). Rice, maize, wheat, and potatoes are the chief economic products. Kupang is the capital of the Dutch portion, and Dili is the capital of the Portuguese portion.

Borneo (284,000 square miles; 2,000,000 population). The Dutch own rather more than two-thirds of the island. The chief exports are timber, petroleum, coal, diamonds, gutta-percha, and copper. Banjarmasin (46,000) is the capital.

The Philippine Islands (115,026 square miles; 12,200,000 population) form an island festoon, distant about 500 miles from the south-east coast of Asia. They comprise more than 3,000 islands and about 4,000 islets, many of them being tiny mangrove-fringed rocks or treeless coral reefs. The largest islands are Luzón, 40,814 square miles, and Mindanao, 36,906 square miles. Most of the islands are irregular, high, and intensely volcanic; and are cut by mountain ranges which leave little room for plains, save where the numerous rivers run into the sea. Many of the volcanoes are still active, and earthquakes are not uncommon. The climate, though tropical, is tempered by sea breezes. The vegetation is luxuriant. There are 40,000 square miles of virgin forest, containing vast potential wealth in cabinet woods, rattans, fibres, dry woods, rubber, tan barks, wood oils, and medicinal plants; and the new Government School of Forestry is now engaged in the marketing of these products.

The potential agricultural wealth of the Philippines is very great, but, as yet, it is little exploited, only 12 per cent of the total area being cultivated. The chief products are manila hemp, tobacco (360,000,000 cigars, and 5,000,000,000 cigarettes annually), coconuts (copra and oil), sugar (500,000 acres), coffee, indigo, maize, rubber, bananas, pineapples, oranges, yams, mangoes, papayas, rice, and cocoa. Coal has been found in great quantities in Samar and Cebú, and the iron deposits in the Surigao and Bukidnon provinces have proved to be of the greatest importance. Manufactures are represented by saw-milling, sugar, tobacco, and the staple abaca, or manila hemp.

Most trade is with the United States, the Far

Eastern countries, and the United Kingdom. The chief exports are manila hemp, sugar, copra, tobacco, cigars, cigarettes, and coconut oil; and the chief imports are rice, cotton goods, iron and steel goods, wheat, flour, cattle, and coal. *Manila* (286,000), the capital and chief port; *Cebu* (65,000); *Iloilo* (50,000); and *Zamboanga* (31,000) are the chief towns.

British East Indian Possessions. *Borneo.* Rather less than one-third of the Island of Borneo is under British protection. This area is divided between Sarawak (the territory of Raja Brooke), North Borneo (administered by the British North Borneo Chartered Company), and the little State of Brunei (ruled by a native sultan with a British Resident as adviser). The chief exports are petroleum, sago, plantation rubber, jelutong, pepper, cutch, timber, tobacco leaf, coal, copra, camphor, hides, beeswax, trepang, edible birds' nests, sharks' fins, rattans, and tortoiseshell; and the chief imports are rice, cloth, ironware, tinned provisions, sugar, tobacco, kerosene oil, and matches. Most trade is with the United Kingdom and the Empire, and is carried on through Singapore and Hong Kong. *Brunei* (14,000) is the capital of Brunei; *Sandakan* of North Borneo; and *Kuching* of Sarawak.

THE INDO-CHINESE PENINSULA

Siam (200,234 square miles; 11,506,000 population), one of the few independent tropical kingdoms of the world (its integrity is guaranteed by the Anglo-French Agreement of 1904), is a buffer state between British Burma and French Indo-China. It is an alluvial lowland, comprising the basin of the Menam, and part of that of the Mekong, lying between the high backbone of Malaya and the old ridges of Indo-China. Its climate is tropical monsoonal. In the south the annual rainfall is not far short of 100 in.; in the north it averages 60 in.; and in Central Siam and Bangkok about 50 in.; while the east is arid and sun-scorched. The temperature everywhere in the plains is high (in Southern Siam in the eighties all the year round).

Productions and Industries. Rice-growing is the chief industry. Though cultivated by primitive methods, the best quality Siamese rice is second to none in the world, and approximately 1,500,000 tons are exported annually. Important agricultural and forest products are cotton, sugar, millet, pepper, fruits (mangosteen, lemon, orange, banana, and melon), ginger, cinnamon, cardamoms, gums (betel), rubber, gutta-percha, camphor, sapan, rosewood, ironwood, ebony, teak, coconuts (copra), hemp, tobacco, and coffee. The chief mineral is tin (annual output over 8,000 tons), mined at Puket Island. Other minerals, not systematically worked, are gold, iron, lead, copper, zinc, coal, wolfram, manganese, antimony, and precious stones. Fishing occupies everybody, more or less, and edible birds' nests are exported.

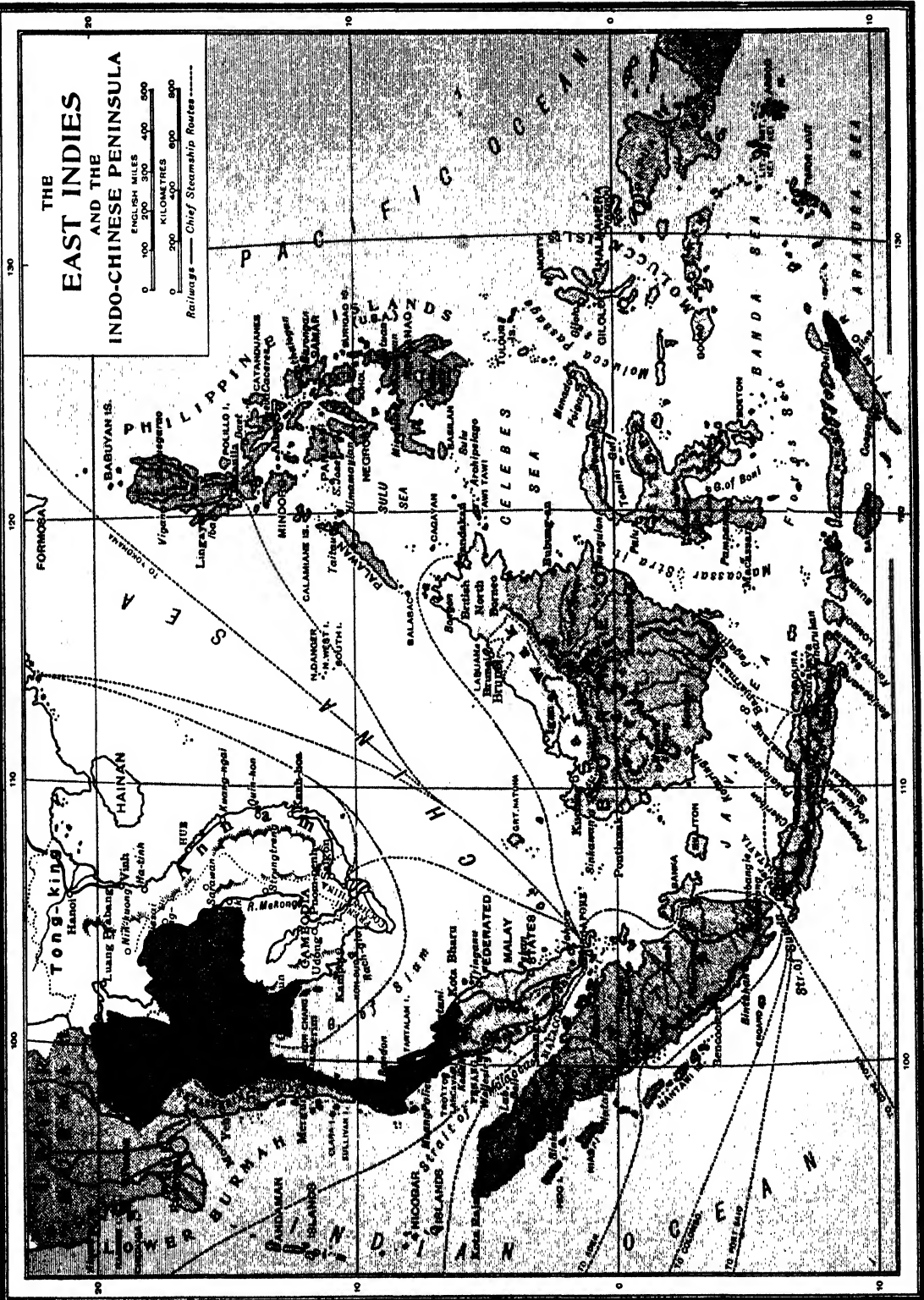
Communications and Commerce. The rivers and creeks are the great lines of communication, and much of the out-of-door life of the people is passed on the water, and pile-dwellings are common. There are 1,600 miles of railway, and railway connection exists between Bangkok and Penang and Singapore. Most trade is with Great Britain, China, Germany, the United States, Holland, Japan, India, and France. A considerable part of the imports and the

THE EAST INDIES AND THE INDO-CHINESE PENINSULA

0 100 200 300 400 500
ENGLISH MILES

0 100 200 300 400 500
KILOMETERS

Railways — Chief Steamship Routes —



Position, Area, and Population. The continent of Africa, the most compact of all the continents, forms a vast peninsula of remarkably regular outline, stretching to the south-west of the great land mass of the Old World. The Equator divides it almost in half, the northern portion being more than double the size of the southern, and extending from west to east some 4,650 miles between Capes Verde and Guardafui. From north to south, between Cape Blanco and Cape Agulhas, its extreme length is nearly 5,000 miles. Compared to a pear, with the point tapering to the south, closely related to Europe in the north-west, and to the adjacent regions of Asia in the north-east, Africa has the Mediterranean Sea on the north, the South Atlantic Ocean on the west, and the Indian Ocean on the east. Joined to Asia by the Isthmus of Suez, 75 miles broad, it approaches at the Straits of Gibraltar to within 9 miles of the coast of Europe, and at the Strait of Bab-el-Mandeb it is separated from the coast of Arabia by less than 15 miles. Its area is 11,500,000 square miles, and its population is estimated at 180,000,000.

Successive civilizations developed in the northern areas in early days, the Egyptian indigenous, the other drawing its inspiration from the Mediterranean. The rest of Africa, shut off by the Saharan barrier from European influence, remains to-day largely uncivilized, and it was not till the sea-way to India was discovered by the Portuguese that South Africa came under the influence of European culture. In the northern areas, Semitic and Hamitic peoples of the white type prevail; elsewhere, and, at least, over two-thirds of the continent, negro and negro races are found. During the last three centuries, Europeans have settled in the more temperate parts in fairly large numbers, and in the inimical tropical regions more sparsely, in order to meet the demand of Europe for the raw materials of commerce.

Coast Line. The coast line is entirely of the Atlantic type where the regular coast, following the broken edge of a plateau, has no relation to the existing mountains and valleys. There are few islands and no festoons of islets parallel with the shore, and the continental shelf is narrow, the plateau rising sharply from the abyssal ocean. Uniformity characterizes the 19,000 miles of coast (less than 1.8 times the maximum perimeter). There are no deep gulfs running into the land, and consequently no well-marked peninsulas. Apart from the wide Gulf of Guinea and the shallow gulfs of Sidra and Gabes, the coast runs in gradual curves, broken on a minor scale only by inlets or projecting headlands. The absence generally of good harbours in Africa has had a profound influence on its social and economic development, and its slow evolution towards civilization. Uniformity is also seen in the absence of important islands, the insular area, most of which is contained in the island of Madagascar, being less than 2 per cent of the whole.

Relief. Most of Africa consists of a vast plateau, composed of rocks of great antiquity. A line drawn from Loanda to Suakin divides the plateau into two distinct areas—a low tableland on the north and west of 1,500 ft. to 2,000 ft. average height, and a higher tableland on the south and east of 3,000 ft. to 4,000 ft. average height. In East Africa great crustal blocks have been let down between parallel

faults, forming great rift valleys. South and east of the great fault area lie the gold-bearing regions of the Witwatersrand; the coal areas of the Transvaal and Natal; the copper regions of the Northern Transvaal; the gold-bearing areas of Southern Rhodesia; the great copper zone of Khatanga in the south of the Belgian Congo; and the gold-fields of the north-eastern portions of the same country. The highest ridge of the African plateau runs almost due north and south, following a line of volcanoes, both active and extinct, the chief peaks of which are Kilima-Njaro (19,328 ft.), Kenya (18,000 ft.), and Elgon. No other equal area in Africa has such a great average height as Abyssinia, where so much lava has been poured out, that lofty, snow-capped highlands have been built up. Northwards lies the great Sahara, never at a great height above sea-level, and in some portions actually below. West of the western rift valley lies the basin-shaped plateau region drained by the Congo. In the north-west are the young folded mountain chains of the Atlas, and south of Algeria rise the Ahaggar Mountains in the midst of the Sahara, continuing through the south-east into the Tibesti or Tu highlands. Of other mountain systems the chief are: the West African, which is of little importance except in Futa Jallon, where the mountains form the watershed of the Niger, the Senegal, and the Gambia; the Northern Nigerian, which contains the Bauchi plateau, the great tin area of Africa; the Cameroon, which culminates in the lofty Cameroon peak; and the South African, which contains the great Drakensberg range. Africa is an inverted saucer, sunk somewhat in the middle, towards which the coastal mountains rise in successive tiers.

The lakes of Africa are second only to those of North America. The principal are: the Victoria and Albert, which feed the Nile; Edward and the picturesque Kivu; Tanganyika, a deep trough; Nyasa, which sends its waters to the Zambesi; and Bangweolo, Lake Chad, and Lake Ngami, in the Sudan and Bechuanaland respectively, which are continental lakes. Lack of a definite water-parting explains why African rivers flow in every direction, the Nile (4,000 miles) to the Mediterranean Sea, the Congo (2,500 miles) to the west, the Niger to the south, and the Zambesi and the Limpopo to the east. The rivers are not only irregularly distributed, but commercial development has been hindered by the plateau structure of the continent, which, though allowing long navigable stretches on the surface of the plateau, compels the rivers to descend the steep slopes to the coast in rapids and waterfalls.

Climate. Africa is the only continent crossed by the Equator and both tropics. The climate is, therefore, in the main, tropical. At sea-level the mean temperature of the coldest month is nowhere under 55° F., and over most of the continent it is over 70° F. In the more temperate regions the seasons are distinguished by temperature; but, in the hot zone, rainfall determines them. Seven climatic regions may be distinguished: the Mediterranean and extreme South-western Regions with the typical "Mediterranean" climate of mild, wet winters, and warm, dry summers; the North and South Desert Regions (Sahara and Kalahari), round the two tropics, where little rain falls and the extremes of temperature are considerable; the North and South Regions of Summer Rains, warm at all

seasons, and very dry in "winter"; the Equatorial Regions, hot and wet nearly all the year round, with maximum rainfall when the sun is highest in the heavens; the High Plateau Region with lower temperature and less rainfall than the Equatorial type; and the High Mountain Region above 9,000 ft. Life for Europeans is healthy in the greater portion of the Union of South Africa; large portions of Rhodesia, especially Southern Rhodesia; the high-land regions of East Africa; the high plateau of Angola; and in Abyssinia, Morocco, Algeria, and Tunisia. In the hot, moist regions of West Africa, the Congo regions, and the coastal areas of East Africa, Europeans can thrive only for a short period, in spite of the great progress made by medical science in eliminating or rendering less deadly the scourges of malaria and sleeping sickness.

Vegetation. The vegetation may be divided into six main types. The first is the Mediterranean vegetation, which prevails both in Northern Africa and in the extreme south-west of South Africa, and is characterized by dry evergreen (or ever-grey), hard-leaf forests, woods, and shrubs. In the south-western extremity the flora is remarkable for the brilliancy of its flowering plants, and the abundance and variety of its heaths. The second type is the desert vegetation—Sahara, Kalahari, and other deserts—sparse or wholly absent, stunted and with succulent and thorny stems and leaves. On the margin of the desert, proceeding in the direction of the Equator, the vegetation increases, forming the third type, the grass and scrub vegetation, which passes imperceptibly into the fourth type, the area of savanna. This extends north, south, and east of the Congo basin, and includes the great Sudan region of West Africa, and much of the high plateaux of East Africa, South Africa, and Angola. Much of this area is suitable for agriculture either with or without irrigation, and cattle flourish wherever the tsetse fly is absent. A luxuriant forest vegetation, the fifth type, is found wherever an abundant and evenly distributed rainfall is combined with an equable temperature. Such is the case throughout much of West Africa from the coast of Sierra Leone eastwards in a broad belt to Cameroon, French Equatorial Africa, the Belgian Congo, and the slopes of the Ruwenzori range. The forests are broken at intervals by river valleys and savannas. An alpine flora, the sixth type, occurs on the higher peaks of East Africa, Abyssinia, and Cameroon.

Economic Conditions. Africa is a continent naturally more or less impenetrable, difficult of habitation by white people in many parts, and with an interior only partially explored. Transport is backward, and labour and colour problems have yet to be solved. Nevertheless, the economic possibilities are very great, and much progress has been made in recent years. The continent forms a great storehouse of tropical products needed in the markets of Europe. It furnishes, or is a possible source of, cereals, cattle, sheep, and fruits; supplies tropical and sub-tropical fibres for the textile industries, vegetable oils, rubber, and ivory; is the main source of Europe's cocoa; has great mineral wealth in gold, diamonds, copper, tin, iron, and coal; and its cotton—Egyptian, Sudan, and Uganda types—competes with the best American varieties. The natives are learning the wants as well as the advantages of modern civilization, and there is an ever-increas-

ing market for European manufactured goods. Undoubtedly, Africa should have a hopeful future.

Political Divisions. The continent is now almost wholly in the hands of European Powers, the only independent states being the negro republic of Liberia, the feudal state of Abyssinia, and the kingdom of Egypt (declared independent, March, 1922). France and Britain between them possess more than half of Africa, the latter having the more valuable areas.

British. The Union of South Africa, Rhodesia, Bechuanaland, Basutoland, Swaziland, the South-West Africa Protectorate, the Anglo-Egyptian Sudan, Somaliland Protectorate, Kenya, Tanganyika Territory, Uganda, Nyasaland, Zanzibar Protectorate and Pemba, Nigeria, Gold Coast Colony, Sierra Leone, Gambia, the Seychelles Islands, Sokotra, Perim, Mauritius, St. Helena, Ascension Island, Tristan da Cunha.

French. The Protectorate of Morocco, Tunis, Algeria, French Equatorial Africa, Senegal, Upper Senegal and Niger, Niger Military Territory, Dahomey, French Guinea, French Ivory Coast, French Sahara, Obok, Madagascar, Réunion, Comoro Islands, French Somaliland.

Italian. Libya, Eritrea, Italian Somaliland.

Portuguese. Portuguese Guinea, Portuguese West Africa (Angola), Kabinda, Portuguese East Africa (Mozambique), São Thomé and Príncipe Islands, the Madeiras, Cape Verde Islands, the Azores.

Spanish. Spanish Morocco, Rio de Oro, Rio Muni, Fernando Po, Annobon, the Canary Islands.

Belgian. Belgian Congo.

Liberia (48,000 square miles; 2,000,000 population) lies to the south-east of Sierra Leone. It originated in the endeavour to repatriate in Africa the negroes of North America, and no white man can become a citizen. The unhealthy coast strip is here much narrower than in other parts of West Africa. Inland the country rises in terraces, and is thickly wooded. Cocoa and cotton are produced in small quantities, and indigenous coffee of excellent flavour is the staple product. *Monrovia* (6,000) is the capital and chief port.

Abyssinia (350,000 square miles; 10,000,000 population) lies in the north-east of Africa, centrally opposite to Aden. It consists of a high plateau, dotted with huge peaks and scored by deep chasms. Pastoral pursuits, especially cattle-rearing, occupy most of the people. Agriculture is impeded by the lack of irrigation, the primitive methods and implements, the bad system of taxation, and the feudal system. The chief crops are coffee, teff, barley, chick-peas, durra, maize, wheat, pepper, and a little cotton. Mineral wealth is scarcely exploited. Transport is extremely difficult. With the exception of the French railway from Jibuti via Diré Dawa to Addis Ababa, all transport is over tortuous tracks by caravans of pack animals. *Addis Ababa* (60,000), the capital; *Harrar* (45,000); and *Diré Dawa* are the chief towns.

EGYPT

Description. Egypt became an independent kingdom in March, 1922, when its Sultan was proclaimed King. British troops are still maintained in order to assure the safety and interests of foreigners and the security of the Suez Canal. The country stretches from the mouth of the Nile southwards



to 22° N. Lat. In the east it includes the peninsula of Sinai, and is bounded by the Red Sea. Westwards, the boundary is an indefinite line passing through the Libyan Desert. Its area is about 383,000 square miles; but its habitable portion, consisting of the Nile delta, and its long, narrow valley varying from 5 to 30 miles in width, is only about 13,600 square miles. Fellâhin, tillers of the soil, Bedouin shepherds or herdsmen, Berberines, Copts, and a few Europeans comprise its 14,300,000 people. The Mediterranean coast is low and sandy, and lagoons, salt marshes, and irrigation canals hinder communication with the interior. Bars at the mouths of the Nile obstruct navigation, and along the shores of the Red Sea there is no harbour, and only Suez is of any importance. Three regions may be distinguished: Upper Egypt, the narrow alluvium-covered valley of the Nile, from Cairo to the southern boundary; Lower Egypt, the delta of the Nile, from Cairo to the Mediterranean Sea; and the desert plateaux on both sides of the Nile. It is often said that Egypt is the gift of the Nile, but it is equally true to assert that Egypt is the Nile. Without it, Egypt would be a desert. From Abyssinia it brings down the fertilizing mud in several quotas, and provides the means of irrigation so important to this thirsty land. The Nile is also of importance as a waterway, being navigable without impediment as far as the first cataract at Aswan. Except in the Mediterranean littoral, the climate is typically that of the desert. Daily and seasonal ranges of temperature are most marked, and the heat of the summer days is intense. The annual rainfall is exceedingly small; at Alexandria it is only 8·8 in.; at Cairo 1½ in. In Cairo and much of the delta, the mean January temperature is 53° F., the July 84° F. In Upper Egypt, the mean winter temperature is 66° F., while in summer a temperature of 122° F. in the shade is sometimes experienced. By dams (Aswan), barrages (Assiut, Esna, and Zifta), and canals, perennial irrigation is assured; and in Upper Egypt the basin system of irrigation is practised.

Productions and Industries. Egypt is almost exclusively an agricultural country. Its agricultural population, many of whom are small landholders, are proverbial for their industry, and though their methods may seem primitive, they are suited to irrigation and the climate. The Egyptian agricultural year includes three crop seasons. In November, cereals of all kinds (especially wheat and barley), clover and pulses are sown, and are harvested in May and June. The chief summer crops, sown in March and harvested in October and November, are sugar, cotton, millet, fruits, vegetables, and rice. Autumn crops, sown in July and gathered in September and October, include maize, rice, millet, and vegetables. Two or three crops a year are secured on land perennially irrigated, but artificial fertilizing is necessary. West of the Nile, the Siwah and Khargeh oases are noted for their dates. Cotton (much of high grade) occupies in normal years about 32 per cent of the cultivated area, producing some 300,000 tons annually (one-quarter of the world's supply). More than two-thirds of the people are dependent on it either in producing, ginning, baling, marketing, or exporting it; and its national importance is such that nearly every social and economic problem and policy of the country is bound up with it. Egypt's mineral resources, as far as known, are

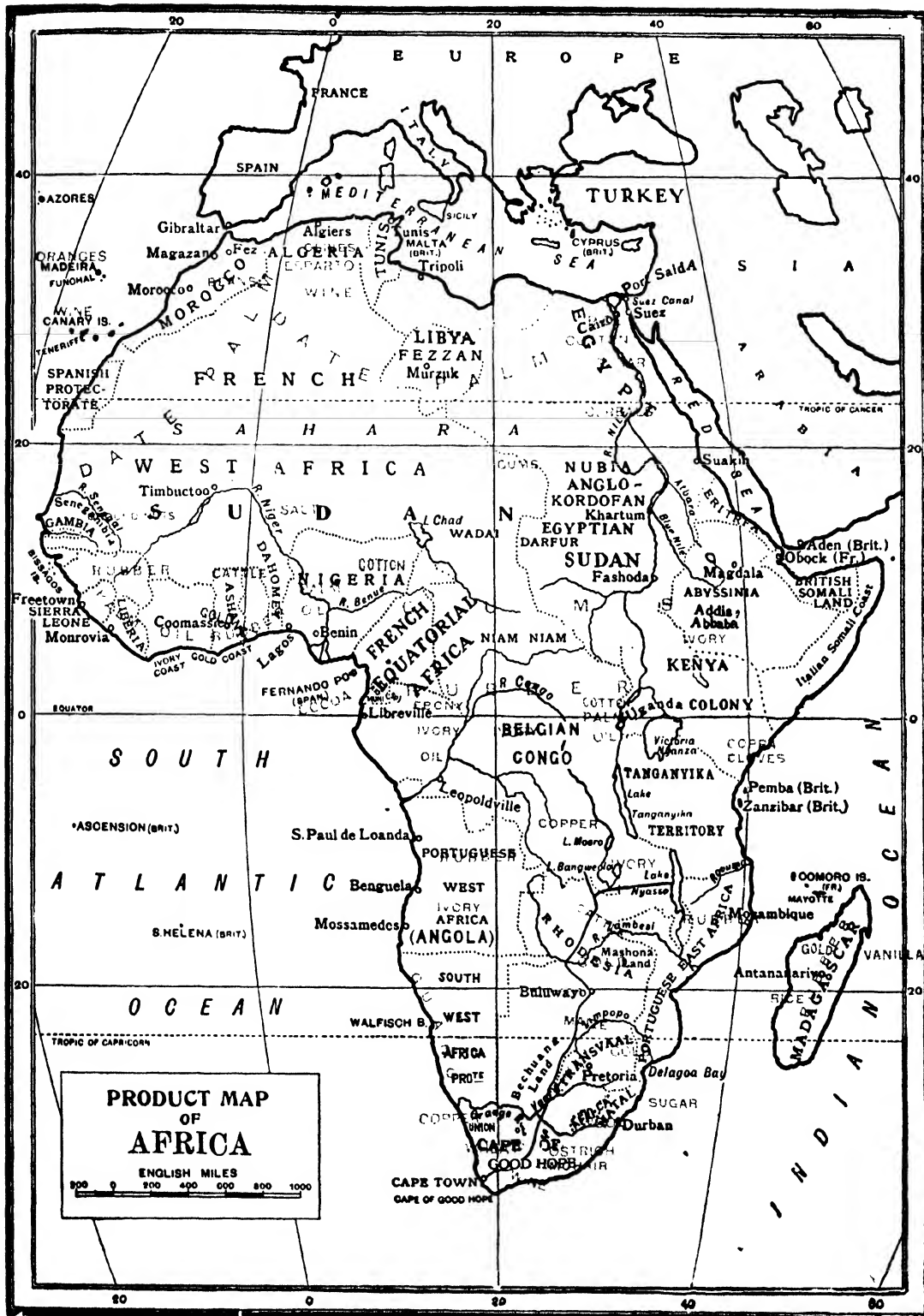
mainly in its deserts, and are little developed. Petroleum is produced at Hurghada and Gemsa, and refined at Suez; phosphates are extracted from beds at Qosseir, Sefaga, and Sebaia; and the Sinai Mining Company has an annual production of about 133,000 tons of manganese ore.

Commerce and Trade Centres. There are 2,800 miles of railway, mostly State-owned. The principal railways radiate from Cairo to Alexandria (and on to Rosetta), Damietta, and Ismailia (continuing northwards to Port Said and southwards to Suez). From Cairo an important line runs southward to Shellal (55½ miles), whence there is steamer traffic to Wadi Halfa, and connection with the Sudan railways. Westwards from Alexandria is a line which will eventually reach Sollum. Air mail services are established between Cairo and Bagdad. The chief exports are cotton and its by-products, such as seed, oil, and cake (normally 90 per cent of all the exports), eggs, onions, manganese ore, hides, skins, benzine, phosphates, wool, wheat, beans, sugar, maize, rice, tobacco, and ostrich feathers, gums, and ivory, which are brought from Equatorial Africa by caravan and river. The chief imports are textiles, coal, hardware, vehicles, chemicals, glassware, chinaware, soap, paper, matches, cutlery, foodstuffs, woodwork, tobacco, and machinery. Most trade is with the United Kingdom, Germany, India, Turkey, France, the United States, the Near East countries, Belgium, Italy, and Australia. *Cairo* (1,065,000), the capital, and the largest city in Africa; *Alexandria* (573,000), the only modern port of the delta; *Port Said* with *Ismailia* (105,000), an important coaling station; *Assiut* (57,000), the capital of Upper Egypt; *Aswan* (17,000), a rail and river centre; *Suez* (41,000), the Red Sea outlet of the Suez Canal; and *Rosetta* and *Damietta*, delta ports, are the chief towns.

THE BRITISH EMPIRE IN AFRICA

Gambia consists of an enclave at the mouth of the Gambia River, on the west coast of Africa (extending about 220 miles from the sea), commanding the navigability of that great waterway. It comprises 4,134 square miles with a population of 213,000. Much of the land is low-lying and swampy. The climate is fairly healthy, except during the rainy season. The chief exports are ground nuts (70 per cent), rubber, beeswax, palm kernels, hides, and calabashes; and the chief imports are cotton goods, kola nuts, rice, flour, soap, spirits, hardware, sugar, wine, tobacco, and salt. *Bathurst* (9,300) is the capital.

Sierra Leone. The Crown Colony and Protectorate of Sierra Leone lies between French Guinea and Liberia. Sierra Leone proper consists of a strip of land stretching for 210 miles along the coast, with a width seldom exceeding half a mile, and an area of 4,000 square miles. Behind lies the protectorate, which has an area of 27,000 square miles. The population of the colony is 86,000, of whom only about 1·5 per cent are whites; while that of the protectorate is vaguely estimated at 1,457,000. The northern half of the country is moderately mountainous, the southern low and swampy. Generally, the climate of the coast lands is very unhealthy ("The White Man's Grave"), and even the highlands are only comparatively healthy. The chief exports are kola nuts, palm oil, palm kernels, pepper, ginger,



piassava, hides, cattle, copal, oil seeds, rice, ground nuts, beeswax, rubber, ramie, and fruits; and the chief imports are cotton goods, apparel, coke, coal, kerosene, tobacco, hardware, provisions, spirits, sugar, and tobacco. *Free Town* (44,000), the capital, is a naval, military, and coaling station.

The Gold Coast comprises the Gold Coast Colony (23,490 square miles; 1,172,000 population); the Ashanti Colony (24,560 square miles; 407,000 population); the protectorate of the Northern Territories (30,600 square miles; 531,000 population); and the mandate land of British Togoland (13,041 square miles; 276,000 population), thus embracing approximately 80,000 square miles, and a population of 2,300,000 (only 2,200 Europeans). It lies to the north of the Gulf of Guinea, extending some 534 miles along a surf-beaten coast, and inland to an average distance of 440 miles. The country is generally low-lying, with the exception of a range of hills (under 2,000 ft.), stretching from the north-west from the Lower Volta into Ashanti. The climate is hot, moist, and unhealthy, and Europeans are brief sojourners in the land. More than half of the world's cocoa is supplied by the colony. Most of the trade is with the United Kingdom. The chief exports are cocoa, gold, manganese ore, kola nuts, timber, rubber, palm oil, and palm kernels; and the chief imports are textiles, building materials, cotton goods, provisions, kerosene, and hardware. *Accra* (39,000), the capital; *Sekondi* (10,000), a port; *Takoradi*, with a recently constructed deep-water harbour; *Kumasi* (21,000), the capital of Ashanti; and *Cape Coast Castle*, a port, are the chief towns.

Nigeria. The Colony and Protectorate of Nigeria includes the territories situated on the Bight of Benin, between Dahomey on the west and the Cameroon on the east. Rhomboidal in shape, it has a coast line of 600 miles, an area of 372,841 square miles, and a population of 20,762,000 Africans and 4,000 Europeans. Most of it lies within the Niger-Benue drainage system, the remainder comprising the subsidiary basin of the Cross River in the south-east, small south-western rivers, independent of the Niger, which enter the coastal lagoons, and a large area of the inland drainage basin of Lake Chad in the north-east. Its general appearance is that of undulating plains, varied by isolated hills and tracts of hilly country. The climate is tropical monsoonal in type, and is endurable by Europeans who take ordinary precautions. Cocoa, rubber, and cotton are plantation crops, and cotton-growing is an imperial venture. Tin, the most important mineral product, occurs around Jos and Bauchi. Coal is mined at Enugu and Udi. Railways have been developed from the principal ports. The western railway extends from Lagos to Kano, and the eastern railway links Port Harcourt to the Enugu and Udi coal-fields and Makurdi. Most trade is with the United Kingdom (about 80 per cent), the Gold Coast, Holland, Germany, France, and Italy. The chief exports are palm oil, palm kernels, gums, rubber, cotton, tin, cocoa, ground nuts, hides, skins, ivory, ostrich feathers, mahogany, shea nuts, and spices; and the chief imports are cotton goods, hardware, salt, soap, kerosene, tobacco, grain and flour, dried fish, kola nuts, spirits, building materials, cutlery, haberdashery, gunpowder, and cycles. *Lagos* (100,000), the administrative centre and chief port; *Ibadan* (136,000), an agricultural and trading

centre; and *Kano* (100,000), a caravan and railway centre, are the chief towns.

Kenya Colony and Protectorate (224,960 square miles; 3,049,000 population; 13,000, British; 20,000, Indians), lying between Abyssinia and Tanganyika Territory, extends inland from the Indian Ocean coast for about 400 miles to Lake Victoria. It consists of a series of zones approximately parallel to the coast. First is the low, narrow coastal plain, fringed with coral islands. From this plain the land rises steeply to the inland plateau, a broad tract of undulating barren country, known as the Nyika. West of Nyika stretch the grassy plains of the volcanic region, attaining an average elevation of 5,000 ft. to 7,000 ft. in the Kikuyu and Laikipia plateaux, and containing the lofty peaks of Kilima Njaro (19,328 ft.) and Kenya. Further west the plateaux descend by steep escarpments, and are cut across from north to south by the Eritrean rift valley, occupied by a series of lakes and rivers without outlet to the sea. The principal river is the Tana, navigable for about 400 miles by shallow-draught steamers. Along the sea's edge lies an endless succession of sandy beaches, and mangrove swamps, broken by creeks and a few harbours, among which is the fine harbour of Kilindini. The coastal islands and plains are moist, hot, and unhealthy, and Europeans need to take precautions against sleeping sickness and malaria. Both to the north and inland the rainfall rapidly decreases. Frosts are not uncommon above 6,000 ft. In the highlands the climate is delightful, and Europeans thrive, provided they take ordinary precautions against the sun. Jungle forests occur along the coast, but generally the region is a grassland.

Agriculture is the mainstay of the colony. In the low-lying areas, where the rainfall is sufficient, rice, coconuts, cotton, simsim, ground nuts, cassava, and sugar-cane are grown; in the highlands, where the temperature is moderate and the rainfall good, there are considerable areas under coffee, maize, wheat, and sisal. Cotton-growing is increasing in the Kivirondo district, near Lake Victoria. Other agricultural products are flax, oil seeds, and rubber. Stock-rearing suffers from rinderpest, and lack of high-grade animals, but the native live stock is being graded up by the introduction of European breeds. Dairying is developing. Tanning material, ebony, pencil cedar, rubber, and gum copal are obtained from the forests. The minerals consist chiefly of iron, opals (in the rift valley), carbonate of soda (Lake Mogadi), mica, gold, natron, graphite, limestone, manganese, silver, and lead.

Most trade is with Great Britain, India, the United States, Japan, Germany, Belgium, Holland, France, and Italy, mainly through Mombasa. The chief exports are cotton, coffee, fibres, maize, hides, skins, carbonate of soda, ivory, copra, chillies, wool, timber, ground nuts, rubber, tanning barks, sugar, gums, and beeswax; and the chief imports are cotton piece goods, rice, grain, flour, building material, petroleum, machinery, vehicles, iron goods, cutlery, hardware, beads, brass wire, tobacco, soap, spirits, paper, stationery, earthenware, glass, and chemicals. *Nairobi* (25,000; 3,500 Europeans), the administrative capital, and the central station of the Uganda Railway; and *Mombasa* (42,000; 1,000 Europeans), the principal port, are the chief towns.

The Uganda Protectorate (94,204 square miles;

3,514,000 population; 1,400 Europeans) lies between Kenya and the Belgian Congo. It forms part of the East African plateau, and a considerable area is over 4,000 ft. The lower parts round the Victoria Nyanza are mostly plains above which the land gradually rises to the Ruwenzori Range (which attains 16,800 ft.) on the west and the high vast crater of Mount Eglog on the east. The soil is very fertile, except in the Rudolf district; and the climate is mild, and fairly healthy, except in the lowlands (malaria and sleeping sickness). Rains fall fairly abundantly, the annual amount being over 50 in. Most of the region is savanna with forest girdles on the mountains and upland pastures above the trees. Coffee is well suited to Uganda, and one variety is indigenous. Cotton-growing (180,000 acres) is a growing native industry, and ginning factories are at work at Kampala. There is a great natural wealth of fibre-yielding plants, and rubber growing is becoming important. Cereals grow with certainty, and wheat cultivation is spreading in Toro. Cocoa, flax, oil seeds, sugar, and rice are raised successfully, and maize is a staple product. The forests yield excellent mahogany and cedar woods. Fruits of many varieties are grown, and the banana forms the staple food. Cattle thrive well in some districts, but rinderpest and the tsetse fly exact their toll. Sheep and goats are plentiful, and are found in most districts. Ivory is obtained in important quantities. The mineral wealth consists of iron, plumbago, copper, and gold.

Most trade is with Great Britain, India, the United States, Germany, Holland, and Japan. The chief exports are ghee (clarified butter), coffee, cotton, chillies, oil seeds, rubber, hides, ivory, skins, and native mats; and the imports are mainly provisions, textiles, metal goods, agricultural machinery and implements. The chief towns are *Entebbe*, the administrative centre; *Kampala*, the chief commercial centre; and *Mengo*, the native capital.

The Zanzibar Protectorate includes the islands of Zanzibar (640 square miles; 138,000 population) and Pemba (380 square miles; 98,000 population). Zanzibar is a low, coralline, continental island, lying in the tepid waters of the Indian Ocean, 25 miles from the African coast, in 39° E. Long. and 6° S. Lat. Its sister island of Pemba, distant about 35 miles to the north-east, is also low-lying, coralline, and continental. Both islands have a plentiful supply of water, derived from springs and streamlets. Zanzibar has a mean annual temperature of 82° F., and a mean annual rainfall of 52 in.; while Pemba has 77° F. and 68 in. The cultivation of cloves is the pride of Zanzibar and its virtual monopoly. This spice is exported (10,000 tons annually) to London, Bombay, and New York. Other agricultural products are cassava, maize, millets, beans, yams, rice, coconuts, oranges, sugar, tobacco, nutmegs, chillies, oil seeds, vanilla, and tropical fruits. Zanzibar is regularly served by steamship lines belonging to the chief European countries, and is visited yearly by 5,000 dhows. The chief exports are cloves, gums, ivory, copra, rubber, hides, piece goods, rice, and grain (some of these are re-exports); and the chief imports are cotton goods, iron goods, beads, groceries, rice, grain, petroleum, sugar, tobacco, copra, and ivory. *Zanzibar* (42,000), the "Metropolis of the East African Coast," is the only city of importance.

The Nyasaland Protectorate (37,890 square miles; 1,393,000 population; 1,500 Europeans) comprises the western shore of Lake Nyasa, with the high tablelands separating it from the basin of the Loangwa River, and the region lying between the watershed of the Zambesi and Shiré rivers on the west, and the Lakes Chinta and Chilwa, and the River Ruw on the east, including the mountains of the Shiré highlands and Mlanji. Climatic differences are great. The Shiré lowlands sometimes experience shade temperatures of 120° F., and the tsetse fly is common almost everywhere up to 3,000 ft. Mineral wealth is negligible; but agriculture is developing and promises great importance. Plantations have been established, and cotton (3,000,000 lb.), tobacco (6,000,000 lb.), coffee, chillies, ground nuts, tea, sugar, rubber, rice, maize, wheat, fibres, beans, cassava, millet, sweet potatoes, sorghum, and gourds are raised. The chief exports are cotton, tobacco, chillies, coffee, rubber, the poisonous drug called *strophanthus*, ground nuts, ivory, tea, and fibres; and the chief imports, of which 80 per cent come from the United Kingdom and the British Empire, are provisions, cotton goods, earthenware, hardware, and salt. *Blantyre* (7,000 natives; 300 Europeans) is the chief trading and missionary centre; and *Zomba* is the headquarters of the Government.

Tanganyika Territory (374,000 square miles; 4,859,000 population; 3,000 Europeans), former German East Africa, is administered under mandate of the League of Nations. It lies between the Rovuma and Kilimanjaro, between Lakes Nyasa and Tanganyika, the Belgian Congo, Victoria Nyanza, and the Indian Ocean. Its 600 miles of coast shows little variation of form, but contains the excellent harbour of Dar-es-Salaam. Three regions may be distinguished—the coastal plain, the flat central plateau, and the more rugged hilly lands in the west. Along the western border extends the continuation of the great western rift valley, Lakes Tanganyika and Nyasa filling its deepest parts. The Rovuma, Rufiji, Wami, and Pangani are the chief rivers, but do not form navigable routes into the interior. The climate is monsoonal. Most of the land is hot and unhealthy, especially along the coastal plain, which, with the western mountains, alone receives abundant rainfall. Malaria and sleeping sickness are scourges of the lowlands. Along the edge of the sea lies an endless succession of sandy beaches and mangrove swamps. Agriculture is the chief industry. Coastal plantations produce coconuts, cacao, vanilla, rubber, sugar, and tobacco. Coffee (on the higher lands), cotton, sisal hemp, cardamoms, cinchona, flax, maize, and other grains are grown successfully. The natives grow bananas, millets, ground nuts, rice, sesame, beans, and maize, and collect from the forests rubber, copal, fibres, and lichens. The tsetse fly and rinderpest reduce the live stock, but there are 3,200,000 cattle, and 3,500,000 sheep and goats in the country. As yet, the mineral wealth (which includes salt, gold, coal, iron, lead, copper, mica, and precious stones) has been little exploited.

Roads are few, and there are only two railways—the Usambara from Tango to New Moshi (220 miles), and the Central (780 miles) from Dar-es-Salaam to Kigoma. The foreign trade, largely conducted by Indians, is chiefly with the United Kingdom, India, Germany, Holland, Japan, and

the United States. The chief exports are rubber, copper, ivory, coffee, sisal hemp, hides, skins, ground nuts, ghee, beeswax, simsim, and grain; and the chief imports are cotton piece goods, foodstuffs, kerosene, tobacco, spirits, wines, beer, and hardware. *Dar-es-Salaam*, the capital and chief port, is a well-planned, healthy, tropical town.

The Somaliland Protectorate (68,000 square miles; 350,000 Somalis and Arabs) lies along the north coast of the Horn of Africa. Most of it is a high tableland, rising sharply from the sea to a height of 7,000 ft., and falling southward to 2,000 ft. There are no rivers which do not dry up in the hot weather. The coastland is torrid, with a scanty rainfall; but the high inland country is healthy, and receives from 10 in. to 20 in. of rain a year. On the plains little flourishes except thorny scrub and mimosas, thinly scattered and serving as camel fodder. Cattle, camels, sheep (fat-tailed), goats, and ponies comprise the wealth of the semi-nomadic Somalis. Good indications of oil are found on the plains south of Berbera. Somaliland is of great strategical importance. It passively secures the traffic through the Suez Canal, and could, in case of need, provide large numbers of slaughter and transport animals for the use of armies operating in the East. Its chief exports are hides, skins, live stock, ghee, gums, pearls, ostrich feathers, ivory, spices, and coffee. *Berbera* (30,000) is the chief town; and *Zeila* is a small port and caravan centre.

The Anglo-Egyptian Sudan (1,008,100 square miles; 5,606,000 mixed negro and Hamitic peoples; 3,000 Europeans) is bounded eastwards by the lofty bastion of Abyssinia and by the Red Sea, and westwards it stretches to French Equatorial Africa, its boundary ill-defined. Its short coast line is rugged and uneven, strewn for much of its length with sunken reefs and rock-bound inlets. Port Sudan and Suakin have, with much capital expenditure, been made secure for ocean-going vessels. Four regions may be distinguished: the swampy, low regions round the White Nile, Bahr-el-Ghazal, and Sobat in the south; the slopes drained by these rivers, comprising rich savanna land; the bordering deserts; and the flood valley of the Nile in the north. The whole region lies in the tropics, and the mean annual temperature approaches 80° F. South of 10° N. Lat. copious summer rains fall; northwards the rainfall decreases, and agriculture becomes dependent on irrigation. Vast tracts in the north receive no rain, and desert conditions prevail. Further south, meagre steppes of dry and wiry bunch-grass alternate with knee-high scrub, now open, now fairly close. In the immediate vicinity of the Nile savanna is well developed.

Agriculture is the principal occupation; but the methods are primitive. Irrigation has received much attention, and the Gezira area (by means of a dam on the Blue Nile at Makwar) has thousands of acres of irrigated cotton-fields. Cotton production is increasing, and promises great importance at Kassala, Dongola, Gezira, and in the south. Other agricultural products are dhurra, millet, sesame, senna leaves and pods, ground nuts, dates, pulses, rubber, and cereals. The finest gum comes from Kordofan (the Sudan is the principal source of the world supply of gum arabic; annual production, 12,500 tons), and excellent rubber from the Bahr-el-Ghazal region. The forests, lining the banks of the

Blue Nile and its affluents, are rich in fibres and tanning materials. Iron is plentiful, and gold is worked at Gabait. On the savannas, steppes, and scrub country cattle are kept, and hides and skins are exported. The cattle trade is growing, and Egypt gets much of its meat supply from the Sudan. The full development of the Sudan needs more irrigation works, dry-farming methods, more railways, and road traction.

The lack of transport and adequate roads have retarded the country's progress. Little more than 2,000 miles of railway, mostly well-laid single line, are in operation. The main railway, part of the Cape to Cairo route, runs from Wadi Halfa across the desert to Abu Hamed, and thence to Berber and Khartoum. From Berber a line runs to the Red Sea coast to the ports of Port Sudan and Suakin, and this line is connected by a branch to the cotton-growing area of Kassala. From Khartoum a line runs to Sennar, and another proceeds from Sennar westwards to El Obeid, and north-eastwards to Kassala. A new section from Gedaref to Makwar (140 miles) was opened in 1929. Schemes have been proposed for railways to connect Khartoum with Uganda, communication now being only by river steamer between Khartoum and Rejaf. Trade is conducted by caravan, rail, and river, and is chiefly with Egypt, Great Britain, India, and Aden. The chief exports are gums, skins, cattle, ivory, ostrich feathers, cotton, salt, beeswax, sesame, senna, and rubber; and the chief imports are cotton textiles, water-raising appliances, and simple agricultural implements and machinery. *Khartoum City* (25,000), the capital and chief transit centre; *Khartoum North* (16,000); *Omdurman* (60,000), the old Mahdist capital; *Port Sudan*, the seaward terminus of the Sudan Railway; *Suakin*, another Red Sea port; and *El Obeid*, the capital of Kordofan, are the chief towns.

British Cameroon (34,236 square miles; 750,000 population), once part of the German Protectorate of Kamerun, lies between Nigeria and French Cameroon, and is under mandate. Most of the trade is with Britain and France. The chief exports are rubber, palm oil, palm kernels, coffee, cocoa, and ivory; and the chief imports are clothing, textiles, fish, meat, and provisions. *Buca* is the capital; and *Victoria* is the chief port.

Togoland. The former German colony of Togoland is under mandate to Britain and France (British, 13,041 square miles; 276,000 population; French, 21,000 square miles; 1,000,000 population). It is situated between the Gold Coast and French Dahomey. Its low, narrow, coastal strip is fringed with lagoons, but for some 50 miles inland there are undulating plains, which end in a plateau, about 1,000 ft. in mean height. Generally, the climate is hot and unhealthy. Coffee, cocoa, cotton, maize, kola nuts, gums, ground nuts, vegetable butter, yams, plantains, palm oil, palm kernels, indigo, fibres, rubber, and ebony are the chief agricultural and forest products, and they form the chief exports. Cotton goods, salt, tobacco, metals, hardware, and spirits are the chief imports. *Lome*, the capital and chief port; and *Misahöhe*, the leading inland centre, are the chief towns.

The Seychelles Archipelago (156 square miles; 28,200 population, mostly of African descent) consists of a group of about 90 islands, lying 930 miles

north of Mauritius in 4° S. Lat. All are mountainous, and are composed of granite and volcanic rocks. The climate, though hot and wet, is not unhealthy. Coconuts (copra and coconut oil), cinnamon, vanilla, olive oil, cinnamon oil, tortoise-shell, soap, and gums are the chief economic products. *Port Victoria*, on Mahé, possessing an excellent harbour, is an Admiralty coaling station.

St. Helena (47 square miles; 3,900 population), once a very important station, has declined; but its strategic importance as a coaling station for the British Navy, has lately been reorganized, and modern fortifications, with heavy guns, have been constructed by the Imperial Government. Fruit and vegetables are grown, and cattle reared for local use. New Zealand flax (phormium) is almost the sole export. *Jamestown* (1,500), the only considerable place in the island, is a port of call for sailing ships.

Ascension Island (34 square miles; 150 population), a dependency of St. Helena, is a station of the

British West African naval squadron, and is resorted to by merchant vessels trading with South America and the West African settlements. *Georgetown* is the capital.

Mauritius (720 square miles; 394,000 population) is an island in the Indian Ocean, about 500 miles east of Madagascar. Except in the north, it is mountainous; but considerable plains lie between the hills, and the coasts are low and fringed with coral reefs. The rocks are predominantly volcanic, and weather to make very fertile soil. The climate is hot and damp; the rainfall is heavy; and the island is continuously exposed to the south-east trade wind. Sugar growing (180,000 acres) is the chief industry. Coconuts, hemp, and vanilla are grown.

The chief exports are sugar, fibres, molasses, rum, vanilla, and coconut oil; and the chief imports, which are almost entirely from Britain, are manure, cotton goods, machinery, iron goods, coal, and soap. *Port Louis* (54,000) is the capital.

THE UNION OF SOUTH AFRICA

CAPE OF GOOD HOPE

Province	Area in Square Miles	CENSUS POP., 1926		Total	Chief Productions and Trade
		European	Non-European		
Cape	276,966	706,137	2,366,720	3,072,857	Cattle, 10,500,000; Coal, 13,500,000 tons; Sheep, 41,000,000; Butter, 25,000,000 lb.; Goats, 7,600,000; Maize, 1,830,000 tons; Copper, £600,000; Wheat, 250,000 tons; Tin, £330,000; Sugar, 243,000 tons; Imports, £75,000,000; Exports, £97,000,000; Wool exported, 260,000,000 lb.; Wine, 13,000,000 gal.; Diamonds, £12,500,000; Gold, £43,000,000.
Natal	35,284	158,916	1,528,804	1,687,720	
Transvaal	110,450	608,622	1,782,014	2,390,636	
Orange Free State	49,647	202,985	489,972	692,957	
Total	472,347 (1931)	1,676,660 1,827,166	6,167,510	7,844,170	

This province embraces the southern part of Africa, and included in it are Pondoland, Bechuanaland, Walfisch Bay (whaling station and good harbour), and the Transkeian territories (Transkei, Tembuland, Griqualand East, and St. John's). Its sea-coast is strangely inhospitable. Good natural harbours are almost entirely lacking, most of the existing harbours being unprotected river mouths choked by sand-bars; and the ports are at great distances from one another. Walfisch Bay and Saldanha Bay form excellent harbours on the west, but lack good productive hinterlands. Table Bay is artificially protected by a breakwater, 2,000 ft. long. Simon's Town, on False Bay, is an excellent naval station, but its situation is against commercial development. On the south coast, Port Elizabeth, on Algoa Bay, has a harbour of the roadstead type, and is exposed in summer to south-easterly winds. The harbour of East London, on the east, is exposed and dangerous.

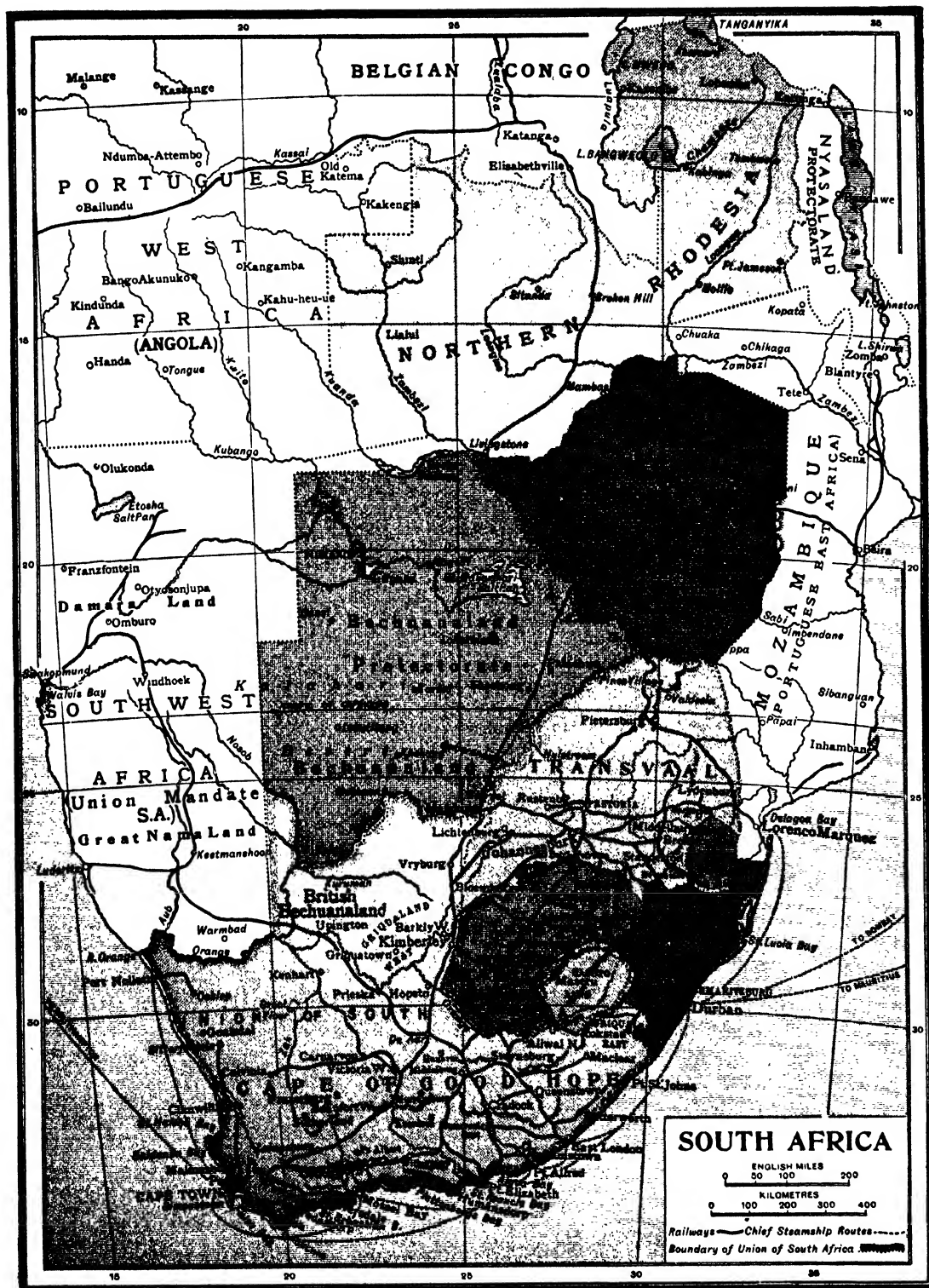
Relief. The surface consists very largely of a great tableland, which rises irregularly and abruptly by a series of terraces from the coast to the interior. The rise from the sea is marked by the shore slope, the Little Karoo, the Great Karoo, and the High Veldt. Long ranges of flat-topped mountains, crossing the colony from west to east and running parallel to the coasts, form the southern edges of the terraces. Commencing at the coast, the first terrace is limited by the Lange Bergen, whilst farther north rise the lofty Zwarté Bergen, and between the two ranges lies the clayey tableland of the Little Karoo. The wide, pastoral Great Karoo, which rises to heights of from 2,000 ft. to nearly 4,000 ft., stretches from the Zwarté Bergen to the range known by the names of the Roggeveld, Nieuwveld, Storm Bergen, and Sneeuw Bergen. Beyond the mountains extends the pastoral Upper Karoo, forming part of the great African plateau. The rivers suffer from varying volumes, cataracts, and bars at their mouths, so that their use to commerce is very restricted. The chief are the Orange (longer than the Rhine) with its tributary, the Vaal, the Great Fish River, and the small Breede River.

Climate and Vegetation. Dry, clear air, suitable for invalids with chest complaints; small rainfall over a great portion; dust storms in the interior, and occasional thunderstorms, are the marked characteristics of the climate. The south-west has

a "Mediterranean" climate (rainfall, 12 in. to 30 in.; Capetown, 75° F., January; 47° F., July); the eastern region has summer rains from the south-east trade winds (rainfall, 16 in. to 30 in.; Port Elizabeth, 74° F., January; 49° F., July); and the north-western region receives practically no rain. The south-west has the typical Mediterranean flora, and the arid north-west has scrub and bulbous plants. Natural forest is rare.

Productions and Industries. Labour and race problems, the difficulties of agriculture, and the hindrances to communication, are disadvantages in the way of economic development. Agriculture is not of prime importance. Wheat, barley, oats, rye, "mealies" (maize), lucerne, and tobacco are among the chief crops. Wheat thrives on the Malmesbury plains; maize is the most certain crop and the staple food of the natives; lucerne is cultivated on irrigated tracts; and tobacco is important in the rich limestone valley of Oudtshoorn. The cultivation of the vine is increasing, but the quality of the wine and the brandy is not high, owing to the high percentage of sugar in the grapes, and the necessity of pressing them in the hottest season. The chief districts are in the west—the Cape, Stellenbosch, Paarl, Malmesbury, Worcester, and Robertson divisions. Excellent grapes, pears, nectarines, apricots, figs, plums, apples, melons, and quinces find excellent markets in the European winter. The pastoral industry is one of the mainstays of the Cape Province. Cattle number 2,850,000. Butter is made in the districts of Cathcart and Bedford, and cheese in Griqualand East and Bechuanaland. Angora and common goats (5,000,000) are very profitable. There are about 18,000,000 sheep (14,000,000 merino), the chief districts being the eastern and south-western tracts, and the Karoo. Ostrich farming on lucerne or on the natural veldt is chiefly in the Oudtshoorn Division. Mineral wealth, especially diamonds, is great. Ninety per cent of the world's diamond production comes from Kimberley (the chief) and Barkly. Copper is found throughout Namaqualand, but especially round Ookiep.

Commerce and Trade Centres. There are three main railway lines: the Western (Royal Mail Route to the diamond and gold-fields) from Cape Town through De Aar Junction, Kimberley, and Mafeking into Rhodesia; the Midland from Port Elizabeth to Naauwport, with branches to De Aar Junction, Bloemfontein, and Pretoria; and the Eastern from



East London through Queenstown, Cyphergat, and Burghersdorp to Springfontein. The exports are chiefly diamonds, gold (from the Transvaal), wool, hides, copper, skins, furs, ostrich feathers, mohair, fruits, maize, and wine; and the chief imports are grain, flour, woollen and cotton goods, leather, machinery, clothing, boots, stationery, iron goods, and chemicals. Cape Town, Port Elizabeth, East London, and Port Alfred are the chief outlets. Most trade is with the United Kingdom, the other South African provinces, the British Empire, Germany, and the United States. *Cape Town* (231,000), the capital, and the seat of the Legislature of the Union; *Kimberley* (38,000), the capital of the "Diamond Diggings"; *Port Elizabeth* (55,000), a busy port; and *East London* (38,000), the premier wool port, are the chief towns.

NATAL

Description. Natal, the "Garden Colony," with Zululand and Tongaland, extends along the coast of South-East Africa (360 miles), from the Cape Province to Portuguese East Africa. Its few white people have to solve the racial problem presented by the numerous indigenous blacks and the many Asiatics. Fundamentally, the country rests upon a huge mass of granite, flanked by granite-like rocks. Except for the level strip along the coast, only a few miles wide, Natal is a hilly country, nearly all above 2,000 ft.; and in the Drakensbergen the peaks of the Giant's Castle and Mont-aux-Sources attain 11,000 ft. Behind the coast belt the land rises in a series of dissected terraces to the Midland plateau, and again to the upland belt and the precipices of the Drakensbergen. Rapid, shallow streams cross these belts, providing a source of electric power, now used in part for railway and industrial purposes. Owing possibly to the influence of the Mozambique current, the climate is warmer than might be expected from the latitude. The south-east trade winds bring plenty of moisture, the province being the most favoured in the Union in this respect (Durban, 42 in.; the highlands of the north, 30 in.).

Productions and Industries. Agriculture is largely in the hands of European capitalist farmers, who own large plantations. The sugar industry (area from Port Shepstone into Zululand) supplies the whole of South Africa, and a large export to Europe. Tea is cultivated in decreasing quantities on account of the restrictions imposed on Indian immigration; but the black wattle, grown for its bark, tends to increase. Maize and tobacco are grown for export; and coffee, bananas, arrowroot, ginger, rice, pineapples, oranges, cotton, and pepper are coastal products. Sheep, cattle, horses, and goats are reared on the grasslands in the midland and upland belts and in Zululand. The chief coal area is in the north, in the valley of the Klip River, between Newcastle and Elandslaagte; and Newcastle, Dundee, Utrecht, and Vryheid are the important centres. Iron, gold, copper, and marble are also mined.

Commerce and Trade Centres. The chief railway centres are Pietermaritzburg and Ladysmith. There is a line roughly parallel to, and, in places, almost on the coast from Shepstone to St. Lucia Bay, passing through Durban. From Pietermaritzburg a westward line connects with the Cape system, and from Durban a line runs to Ladysmith. From here one branch goes westward through Van Reenen's

Pass into the Orange Free State, while another passes through Glencoe, Newcastle, and Laing's Nek to the Transvaal. The chief exports are gold, sugar, coal, wool, hides, skin, and hair (mohair and other); and the chief imports are haberdashery, machinery, cotton and woollen fabrics, clothing, grain, flour, iron and steel goods, wines and spirits. Most of the gold and wool is in transit from across the border. More than half the trade is with the United Kingdom. *Durban* or *Port Natal* (162,000; 71,000 Europeans), the commercial capital and chief port; and *Pietermaritzburg* (40,000), the capital, are the chief towns.

Basutoland. The native province of Basutoland, the Switzerland of South Africa (12,000 square miles; 500,000 natives, 1,600 Europeans), lies between the Caledon River and the top of the Drakensbergen. Much of it is a High Veld region, although its eastern margins are broken by several ranges parallel and subsidiary to the Drakensbergen. The soil is generally fertile and the rainfall is abundant, so that both arable and pastoral farming are carried on. The slopes to the Caledon River are famous for wheat, mealies, and Kaffir corn; but the bulk of the country is rich pasture land on which the Basutos rear thousands of cattle, sheep, and sturdy ponies. The chief exports are grain, mohair, wool, cattle, and horses; and the chief imports are blankets, hardware, and groceries. *Maseru* (2,300), the capital, is a mere kraal.

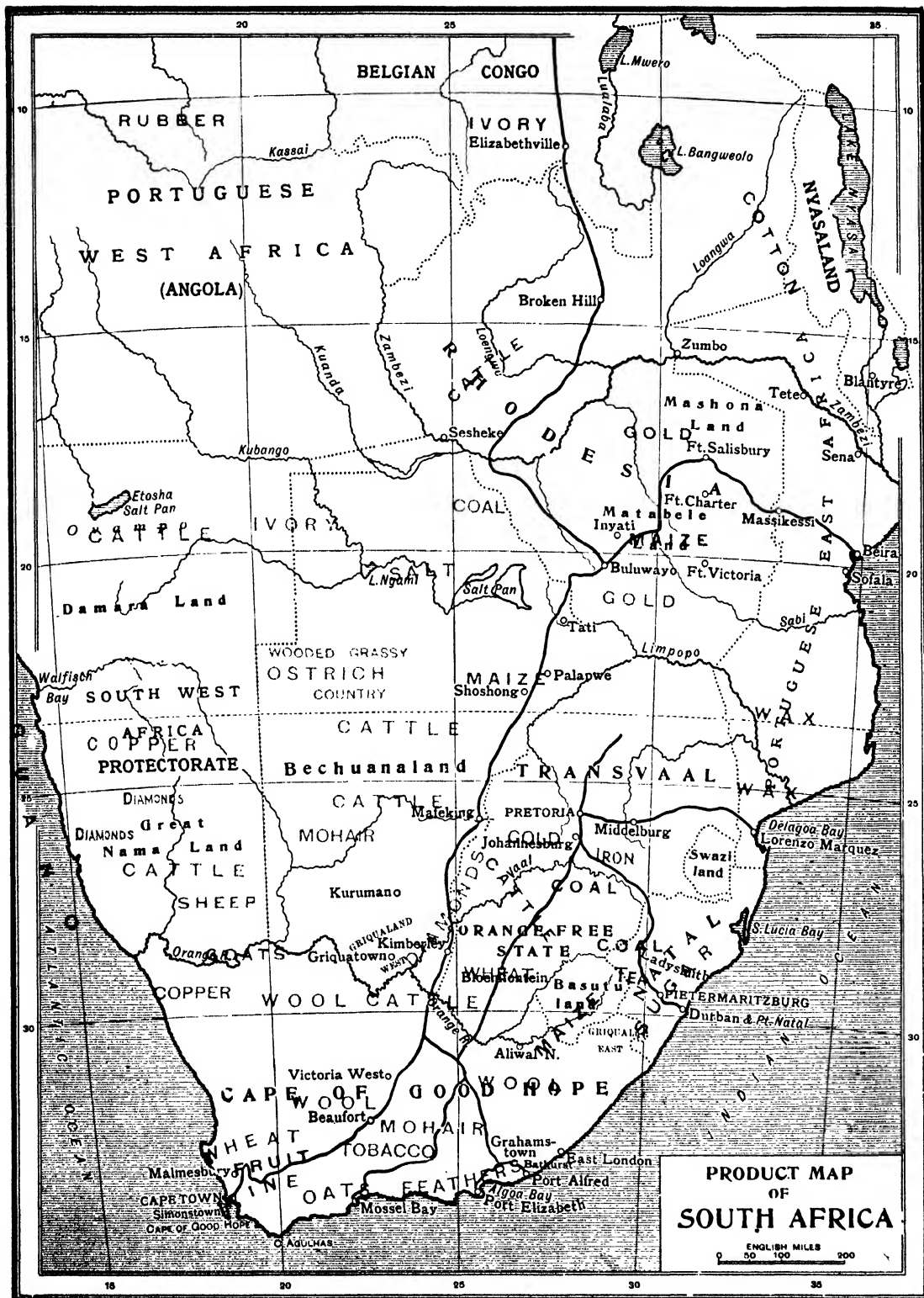
The Bechuanaland Protectorate (275,000 square miles; 153,000 natives, 1,750 Europeans) lies between the Transvaal and South-West Africa. It is a savanna land, richer in the east, where some cultivation is possible, but passing in the west into the dry scrubland of the Kalahari desert margins. Some maize, Kaffir corn (millet), beans, pumpkins, and melons are grown; but the land is mainly given over to the pastoral Bechuana, whose herds of cattle (426,000) have been greatly reduced by rinderpest and drought. *Serowe* is the capital; but *Mafeking*, in the Cape Province, is the administrative headquarters.

Zululand, formerly a separate British Crown Colony, was annexed to Natal in 1897.

The Swaziland Protectorate (6,705 square miles; 113,000 natives, 2,300 Europeans), under the direct control of the Colonial Office, lies between the Drakensbergen and Lebombo Mountains. It is an admirable ranching country, and several large companies have commenced cattle-ranching. The chief agricultural products are maize, tobacco, millet, pumpkins, ground nuts, beans, and sweet potatoes. *Mbabane* is the headquarters of the Administration.

THE TRANSVAAL

Description. The Transvaal, known formerly as the South African Republic, includes the territory between the Vaal River in the south, and the Limpopo in the north. Its surface is an elevated rolling plateau, 3,000 ft. above sea-level, dotted with table-like eminences, called "kopjes," covered with a thin sprinkling of thorny bush, and interspersed with *spruits* or depressions, worn out by the action of streams. From south to north the land slopes down by three natural, but rather vaguely defined divisions, known as the Hooge (High) Veld, the Banker



(Middle) Veld, and the Bosch (Bush) Veld. The northern extension of the Drakensberg Mountains, with the offshoot known as the Magaliesberg, runs north and south, the highest summit being Mount Mauch, 8,725 ft. In the north-east, the surface is rugged, broken, and mountainous. The country is watered by the Vaal and the Limpopo with their tributaries. On the whole, the climate is healthy and delightful; though in the tropical north and in the low veld there is a certain amount of malaria. Johannesburg has a mean summer temperature of about 73° F., and for the winter months about 53° F. The rainfall is heaviest on the eastern mountain range, where it exceeds 30 in.; while on the western plains it sinks to about 15 in. There is little frost, and practically no snow. Droughts occur occasionally.

Productions and Industries. Agriculture and stock-breeding, once the chief industries, are now of much less importance than mining, upon which they are largely dependent for their markets. The great industries of the farmer are cattle raising, maize (mealies) growing, the cultivation of orange groves, pig farming, cheese and butter making, the raising of vegetables, and the cultivation of wheat by dry and wet farming. In the lower valleys sugar and cotton are cultivated. The lands fringing the base of the Magaliesberg, where irrigated, yield excellent oranges, lemons, and other fruits, and admirable tobacco. Mining is the main source of the wealth of the Transvaal. Gold (annual production, £42,000,000; 40 per cent of the world's supply), coal, diamonds, iron, platinum, lead, silver, tin, copper, and cobalt are the chief minerals. Gold has been mined in the Lydenburg district since 1870, but the later opening of the "Rand" mines was the cause of the great immigration from Europe. The famous "banket" reef of the Witwatersrand is the greatest gold-mining area in the world. Near Pretoria is the famous Premier diamond mine, from which the famous Cullinan diamond was extracted; and there are alluvial diggings for diamonds in the Bloemhof district of the Vaal River. There are large deposits of coal, some of excellent quality, worked for domestic, manufacturing, and bunkering purposes, near the Rand (especially at Boksburg), and at Vereeniging, Waterval, and Middleburg.

Commerce and Trade Centres. Railways connect the Transvaal with Durban, Delagoa Bay, and the Cape. Delagoa Bay is the natural outlet, and there is a line directly connecting Pretoria with the Portuguese port of Lourenço Marquez, passing through Koomati Poort. Another main line connects Pretoria with Johannesburg and Bloemfontein; while a third important line, connecting Cape Town with Kimberley and Bulawayo, runs along the western border. The chief exports are gold (more than half the value of all the exports), wool, cattle, hides, game, ostrich feathers, ivory, butter, fruits, tobacco, coal, diamonds, silver, copper, lead, cobalt, and iron; and the chief imports are foods, machinery, railway plant, clothing, chemicals, dynamite, and spirits. Most trade is with the other States of the Union, Great Britain, and the British Empire. *Pretoria* (85,000), the capital, and the administrative capital of the Union; *Johannesburg* (310,000), the largest city in South Africa and the centre of the gold-mining industry; and *Potchefstroom*, the old capital, are the chief towns.

THE ORANGE FREE STATE

Description. The Orange Free State lies between the Transvaal and the Cape Colony. The High Veld, studded with kopjes, occupies the whole of the country, and is of an average elevation of 4,000 ft. to 5,000 ft. The chief rivers are the Vaal, forming the northern boundary, and the Orange River, forming the southern boundary, with its tributary, the Caledon. Most of the province has a rainfall inadequate for agriculture without irrigation or dry-farming methods. The heat in the summer months is great, and the cold in winter is often severe. Generally, the country is steppe with a short and irregular sward.

Productions and Industries. Agriculture, at least by ordinary farming methods, is suited only to the Caledon Valley, where excellent wheat is raised. Other crops include oats, maize (mealies), and Kaffir corn. Most of the country is well adapted to pasturage, and stock and sheep farming give employment to the greater part of the population. Diamonds, of very good quality, are mined at Jagersfontein, Koffyfontein, and in the Kroonstad district. Coal is mainly worked at Viljoen's Drift and at Vierfontein.

Commerce and Trade Centres. The main railway line connects Cape Town, Port Elizabeth, and East London with the Transvaal, running through Norval's Port, Springfontein, Bloemfontein, Kroonstad, and Viljoen's Drift. The East London line connects at Springfontein, and from Kroonstad a branch line runs through Harrismith to the Natal border and beyond to Durban. The chief exports are wool, mohair, hides, skins, meat, wheat, maize, Kaffir corn, fruit, ostrich feathers, and diamonds; and the chief imports are articles of clothing, cotton goods, colonial produce, blankets, wood, and hardware. Trade is mainly with the United Kingdom and the other provinces of the Union. *Bloemfontein* (43,000), the capital and chief trade centre; and *Bethlehem* and *Harrismith*, agricultural and pastoral centres, are the chief towns.

The South-West Africa Protectorate (322,400 square miles; 228,000 natives; 20,000 Europeans), formerly one of the German colonies, is now administered under mandate as an integral part of the Union. Running more or less parallel to the coast, at a distance of approximately 60 to 100 miles, is a broken range of mountains with peaks rising from 6,000 ft. to over 8,000 ft. Between these mountains and the sea, the land is barren desert, except in the Namib region in the north. Inland from the mountains stretches the arid Kalahari Plateau. The climate is arid, rain falling only in thunderstorms in the late summer months. Mining is the staple industry. Alluvial diamonds are obtained from the sands of the coastal desert, especially from the Pomona field not far south of Angra Pequena; and copper is mined at Otavi, Tsumeb, and Grootfontein. Cattle (especially in Hereroland), sheep, goats, horses, and camels are reared. There is railway connection with all the chief centres, and with the Cape railways. Most trade is with the Union. The chief exports are diamonds, copper, lead, marble, cattle, fish, sealskin, guano, horns, hides, wool, and ostrich feathers; and the chief imports are cotton textiles, foodstuffs, iron and steel goods, and machinery. *Windhoek* (3,500 Europeans), the capital; *Angra Pequena*

(Luderitz Bay; 1,100 Europeans), a port; and *Swakopmund* (1,200 Europeans), a poor port, are the chief towns.

RHODESIA

Description. Rhodesia lies between the Belgian Congo and the Transvaal. The Zambesi divides it into the two administrative districts of Northern Rhodesia and Southern Rhodesia. Southern Rhodesia (150,344 square miles; 1,109,000 Bantus; 40,000 Europeans) is a self-governing colony, a civilized land of railways, towns, and farms; while Northern Rhodesia (287,950 square miles; 1,340,000 Bantus; 4,700 Europeans) is a Crown Colony, and largely untamed African bush land. Southern Rhodesia is an undulating plateau, drained in the south-east to the Limpopo, and in the north-east and north-west to the Zambesi. In the west the plateau slopes to the Makarikari salt basin, and as gradually up again. More than two-thirds of its area is over 3,000 ft. high, and a quarter over 4,000 ft. Northern Rhodesia is also an undulating plateau, which is drained by the Kafue, Loangwa, and Chambezi, and contains Lake Bangweolo, and on its northern confines part of Lake Tanganyika. The Zambesi cuts diagonally across Rhodesia. Navigable as far as Tete, its course is broken by the famed Victoria Falls (357 ft. deep, and about one mile in length), just before it enters Southern Rhodesia. This huge source of water-force will provide limitless electric power. In the low parts of Rhodesia the heat is often oppressive, and malaria is present at certain times of the year. Above the fever line (approximately 4,000 ft.), the climate is fine and bracing, and suited to Europeans. Rain falls chiefly in the summer months, the heaviest being in the east (40 in.) and falling to about 20 in. in the west. The country may be divided roughly into three types: bush country, which consists mainly of open plains alternating with woodland; wide and almost treeless plains, covered with long grass; and broken ranges of hills and solitary kopjes, usually well wooded.

Productions and Industries. Mining is, and will probably remain for a long period, the premier and mainstay of all other industries. Gold is mined around Bulawayo, Gwelo, and Selukwe in Matabeleland, in the Hartley, Victoria, and Salisbury districts of Mashonaland, and round Umtali (annual production over £3,000,000). The Wankie coal-field, north-west of Bulawayo, produces excellent coal. Many parts are well suited for agriculture, especially if irrigation methods are employed in the winter. The farms generally range from 3,000 to 6,000 acres. Maize is the staple crop; but wheat, oats, and barley are also grown under irrigation. Tobacco, cotton, and rubber are grown with considerable success. Millet, Kaffir corn, ground nuts, melons, sweet potatoes, tomatoes, peas, rice, beans, pumpkins, and gourds are important native crops. Citrous fruits are receiving attention; and Rhodesian oranges and lemons appear on the London market. Rhodesia is an excellent ranching country. The native cattle thrive well, and with a steady upgrading by means of the importation of good breeding stock, a prosperous future seems assured. Already there are approximately 2,000,000 cattle.

Commerce and Trade Centres. The Rhodesian railways extend from Vryburg northwards to the

Belgian Congo border, and there is through communication from Cape Town to Bukama, in the Belgian Congo. The main line of Southern Rhodesia runs through Bulawayo and Salisbury, and from Salisbury a branch line runs through Umtali to the Portuguese port of Beira. The chief exports are gold, ivory, copper, rubber, cotton, silver, lead, wool, tobacco, cattle, and diamonds; and the chief imports are cotton goods, machinery, iron goods, tea, and sugar. Most trade is with the other South African colonies and the United Kingdom, the overseas trade being carried on chiefly through Beira. *Bulawayo* (8,400 Europeans), the capital of Matabeleland, is the chief commercial centre; *Salisbury* (7,500 Europeans), the capital of Mashonaland, is the seat of Government.

FRENCH POSSESSIONS

Algeria (847,500 square miles; 6,554,000 population; 850,000 Europeans), in North Africa, between Morocco and Tunisia and Libya, is virtually a French "Department." Its natural divisions are the coastal strip of undulating, cultivated land, called the Tell; the high plateaux covered with alfa grass and delicate aromatic shrubs; and the Sahara. The principal agricultural products are wheat, barley, oats, wine (160,000,000 gal.), olives (12,000,000 gal.), esparto grass, tobacco, dates, maize, oil seeds, vegetables, fruits, flax, ramie fibre, and cork. Cattle, sheep, and goats are important. Iron (1,000,000 tons) is worked at Mokra, near Bone, and the region behind Beni Saf; ornamental stone is quarried near Kleber and at Ain Smara; phosphate of lime is obtained at Tebessa (450,000 tons); and petroleum is worked at Oran. Good roads and railways have been constructed. The bulk of the trade is with France. *Algiers* (257,000), the capital and chief port; and *Oran* (164,000), the second port, are the chief towns.

Tunis or Tunisia (48,300 square miles; 2,411,000 population; 160,000 Europeans), the most northerly country of Africa, is a French protectorate. The fertile Majerda valley produces olives, grapes, Mediterranean fruits, wheat, barley, oats, maize, tobacco, and oil seeds. On the high plateaux alfa grass is the chief economic product. In the north-west are forests of cork-oak, evergreen oak, and Aleppo pine. The southern oases produce 90,000,000 lb. of the finest dates annually. Goats, sheep, horses, cattle, and camels are fairly numerous. Extensive phosphate deposits are worked round Gafsa and elsewhere (2,000,000 tons), and iron ore (500,000 tons) is mined near Ref. The transport system is not so well developed as in Algeria. Most trade is with France and Algeria. *Tunis* (222,000) is the capital.

French West Africa (2,100,000 square miles; 13,000,000 population; 10,000 Europeans) includes Senegal, French Guinea with Los Islands, the Ivory Coast, Dahomey, French Sudan, Upper Volta, Mauretania, the Niger Military Territory, most of Togoland, and about three-fifths of the Sahara Desert.

Senegal (74,000 square miles; 1,270,000 population) surrounds Gambia. Its chief products are ground nuts, millet, maize, fruits, hides, skins, rice, castor beans, coconuts, gums, and rubber. *St. Louis* (24,000) is the capital, and *Dakar* (26,000), the chief port.

French Guinea (93,000 square miles; 2,100,000 population) lies between Portuguese Guinea and Sierra Leone. Its chief economic products are palm oil, palm kernels, rubber, ground nuts, rice, gums, cotton, bananas, coffee, gold, hides, skins, cattle, and wax. *Konakry* is the capital.

The Ivory Coast (126,000 square miles; 1,550,000 population) lies between Liberia and the Gold Coast Colony. Its chief economic products are gold, maize, cotton, rice, plantains, pineapples, fruits, cacao, coffee, coconuts, rubber, and mahogany. *Bingerville* is the capital, and *Grand Bassam* the chief port.

Dahomey (42,000 square miles; 980,000 population) lies between the Gold Coast Colony and Nigeria. Its chief economic products are maize, manioc, yams, potatoes, cotton, palm oil, and palm kernels. *Porto Novo* is the capital and chief port.

Togoland (about 24,000 square miles; 900,000 population) produces coconuts, coffee, gums, rubber, palm oil, and palm kernels. *Lome* is the capital and chief port.

French Sudan (648,000 square miles; 2,600,000 population), lying east of the Senegal territories, produces ground nuts, millet, maize, rice, cotton, sesame, rubber, kapok, skins, hides, and wool. *Bamako* (16,000) is the capital. *Timbuktu* (7,000) is a caravan centre.

Upper Volta (154,400 square miles; 3,016,000 population), lying north of the Gold Coast Colony and Dahomey; Mauretania (154,200 square miles; 285,000 population), lying between the Atlantic Ocean and French Sudan; and the Niger Military Territory (405,000 square miles; 1,150,000 population), lying north of Nigeria, are regions largely arid and little exploited.

The Sahara Desert. The French possess about 925,000 square miles of the Sahara, the world's largest desert, a rocky waste of ochreous or red rock plateaux, carved by aerial erosion, and crossed only by camel caravans or caterpillar motors. Railways reach only its verge; but a trans-Sahara French railway is projected. Until the day when the radiant energy of the sun, poured so lavishly upon it, shall be used directly to provide motive power for machinery, the Sahara will continue to restrict its inhabitants to the oases and limit their efforts.

French Equatorial Africa, lying between the Belgian Congo and Nigeria, comprises the territories of Gabon (122,000 square miles; 381,000 population); Middle Congo (150,000 square miles; 581,000 population); Ubangi-Shari-Chad (208,000 square miles; 605,000 population); and the Military Territory of Chad (502,000 square miles; 1,271,000 population). Included in the colony is the greater portion (167,000 square miles; 1,500,000 population) of the former German Colony of Cameroon. The chief economic products are cabinet woods, rubber, vanilla, coffee, cocoa, ivory, kola nuts, tobacco, hides, skins, and copper. Though a region of great economic potentialities in tropical products, the exploitation depends on the development of transport facilities, the education of the natives, and the conquering of sleeping sickness. As yet there has been little development. The chief towns are *Libreville*, the capital of Gabon; *Loango* and *Duala*, ports; *Brazzaville*, the capital of the Middle Congo; *Fort-de-Possel*, the capital of Ubangi-Shari-Chad;

Mao, the capital of Karem; and *Abeshr*, the capital of Wadai.

French Somaliland (12,000 square miles; 50,000 population) lies between Eritrea and British Somaliland. Its chief economic products are salt, hides, skins, coffee, feathers, ivory, gum, and incense. *Jibuti* (8,400) is the capital and chief port.

Reunion (970 square miles; 178,000 population) is a fairy-like volcanic island, a mulatto, lost paradise, 420 miles east of Madagascar. Its chief economic products are sugar, rum, coffee, manioc, tapioca, vanilla, spices, and essences. The capital is *St. Denis* (26,000), and *Point-des-Galets* is the chief port.

Madagascar (228,000 square miles; 3,600,000 population) is a large island, lying off the south-east coast of Africa, from which it is separated by the Mozambique Channel. Its core is an elongated high plateau, composed of ranges of mountains of gneiss and other crystalline rocks. Rice is grown widely, and manioc, cotton, sugar, cacao, coffee, vanilla, tobacco, sweet potatoes, butter beans, cloves, and mulberry trees (silk) are cultivated. Cattle are important on the savannas, and extensive meat-preserving factories are found at Tamatave and Antananarivo. Gold, copper, lead, plumbago (a rival of Ceylon), iron, zinc, precious stones, mica, antimony, nickel, sulphur, and lignite are found. The vast forests yield valuable woods, rubber, gums, resins, and plants for textile, tanning, dyeing, and medicinal purposes. *Antananarivo* (95,000) is the capital; and *Tamatave* (12,000) the chief port.

The Comoro Islands (800 square miles; 100,000 population) are administered as part of Madagascar. Sugar, vanilla, perfume plants, cacao, hides, copra, coffee, cloves, aloes, and hardwoods are the chief economic products.

Morocco (231,500 square miles; 6,000,000 population) occupies the north-western corner of Africa. Most of it is a French protectorate. (There is a Spanish zone, 18,360 square miles, and the international zone of Tangier, 140 square miles; total population, 600,000). To a large extent the country is boxed in between the Atlantic and the Atlas Mountains, which here attain their greatest height, then slope down to the coast by Agadir; while the Rif chain makes a northern mountain wall. The littoral is a fertile plain, drained by a regular series of rivers, chief of which is the Sebou. Among the agricultural products are barley, maize, cummin, wheat, beans, lentils, chick-peas, henna, linseed, coriander, hemp, rose, orange, jasmine flowers (for perfumes), figs, almonds, lemons, olives, grapes, pomegranates, and cotton. Cattle and horses flourish on the lowlands, and Barbary sheep and goats on the hill and mountain slopes. The valuable phosphate fields, lying between El-Borrudj and Oued Zem, have an annual output of 1,000,000 tons, and cork and cedar are industrially exploited. *Morocco* (145,000), the second and southern capital; *Fez* (125,000), the northern capital and the chief centre of the commercial and industrial life of Morocco; *Casa Blanca* (111,000), the port of French Morocco; *Mequinez* (38,000), the central capital; *Rabat* (34,000), the French administrative centre and capital; *Tangier* (51,000), the seat of accredited representatives of the foreign powers; and *Tetuan* (30,000), the capital of the Spanish zone, are the chief towns.

PORTUGUESE POSSESSIONS

The Azores (922 square miles; 250,000 population) are a group of small islands in the Atlantic, 800 miles west of Portugal. St. Michael or San Miguel is the largest. The climate is mild, temperate, and healthy. Oranges, pineapples, cereals, and wine are produced. Many cattle are kept, and the chief industries are the making of butter, cheese, and alcohol. *Ponta Delgada* (18,000) is the chief town of St. Michael; and *Angra*, the capital of Terceira, is a fortified port.

The Madeira Archipelago (314 square miles; 170,000 population) lies south-east of the Azores, and includes the islands of Madeira, Porto Santo, Desertas, Bujio, and Selvagens. Madeira Island is everywhere mountainous, with deep ravines and old lava flows. Its climate is mild and salubrious, and undoubtedly one of the best in the world. The chief products are excellent wines (Malmsey and Verdelho), cereals, and sugar-cane. *Funchal* (26,000), the capital, is an important coaling station.

The Cape Verde Archipelago (1,475 square miles; 180,000 population) lies between 12° and 15° N. Lat., some 400 miles from the west coast of Africa. It consists of fourteen islands and islets, inhabited by Portuguese and mulattoes. The islands are volcanic, and all contain craters and recent eruptive rocks. Tobacco, grapes, rice, coffee, sugar, maize, fruits, millets, drugs, salt, coral, and dried fish are the chief economic products. *Praia*, the capital, and *St. Vincent*, a coaling station, are the chief towns.

Sao Thomé (398 square miles; 55,000 population) and **Príncipe** (44 square miles; 5,000 population) are islands in the Gulf of Guinea. Their chief economic products are cacao, coffee, cinchona, vanilla, rubber, and balsam. São Thomé and Santo Antonio, the capitals, are the only towns.

Portuguese Guinea (14,000 square miles; 400,000 population) is an enclave in the French West African possessions. Its chief economic products are rice, maize, ground nuts, palm oil, skins, rubber, wax, kola nuts, tobacco, indigo, cotton, and mahogany. *Bolama* is the capital.

Portuguese West Africa (Angola and Kabinda; 480,000 square miles; 5,000,000 population; 20,000 Europeans), exposed to the South Atlantic, has a stretch of coast line of 1,020 miles. It is mainly a plateau, rising by terraced hills to moderate altitudes of 1,500 ft. to 2,000 ft. in the north, more rapidly in the centre, and abruptly to 6,000 ft. in the south, where the Shella range stands out sheer. Of the numerous rivers, the Congo drains the interior of the northern half; the Kwanza is entirely in the colony; the Cunene forms the southern boundary; the Kubango flows to the inland Lake Ngami; and the Zambesi drains the south-east. There are open roadsteads at Benguella and Mossamedes; and the only ports on the long coast are Loanda, Lobito, and Tiger Bay. In the north and centre, on the coastal lowlands and along the rivers, malaria is endemic, and sleeping sickness in the Kwanza valley; but on the highlands of the interior, comparative comfort is enjoyed, and on the Benguella and Mossamedes plateau the climate is similar to that of Southern Europe. The mean annual temperature varies from 55° F. to 80° F. The rainfall is very small in the south coastal belt; elsewhere it varies from 40 in. to 60 in. Mining is in the developmental stage. Copper has been located or worked in the

Congo, Kwanza, and Benguella districts, and is widespread in that of Mossamedes. Gold is worked in the Kassinga mines; diamonds have been successfully exploited in the Kassai River; and petroleum is found in several districts. Vast quantities of fish are caught at Mossamedes to be salted, dried, and exported. Farming and stock-rearing have hopeful futures. The chief agricultural products are cereals, cotton, sugar, palm oil, rubber, coconuts, tobacco, ground nuts, coffee, wax, hides, skins, and fruits. Railways run from Loanda to Malanje; Lobito Bay to Changwari (500 miles), planned to meet the Cape-to-Cairo system in the Katanga district of Belgian Congo; and Mossamedes to Vila Sa da Bandeira (Lubango). Overseas trade is mainly with Portugal and Europe. Mealies, coffee, copra, sugar, dried fruits, wax, oils, rubber, ground nuts, and ivory are the chief exports; and machinery, railway materials, provisions, wine, and pedigree stock are the chief imports. *Loanda*, the capital, *Lobito*, *Mossamedes*, *Ambriz*, *Ambaca*, and *Benguella* are the chief trade centres.

Portuguese East Africa (300,000 square miles; 3,200,000 population) extends from the Rovuma River to a short distance south of Delagoa Bay, with a coast line of 1,400 miles. In the north the coast is much indented with many islands lying off it; and in the south it is low, and bordered by many sandhills and lagoons. North of the Zambesi granite formations give rise to a mountainous country, in which the Namuli Mountains rise to 8,800 ft. South of Lake Shirwa lie Mount Malanje and the Serra Morumbala. To the south of the Zambesi the Serra da Gorongosa rise to 6,500 ft.; and the edge of the Manika plateau, running southward, attains 7,900 ft. in Mount Doe. The well-marked Libombo Range separates the Lourenço Marques district from the Transvaal. Among the numerous rivers are the Limpopo, Sabi, and Purgwe in the south; and the Zambesi, with its tributary, the Shiré, the greatest waterway in East Africa. The coastal plain and Zambesi valley are hot, malarious, and unhealthy. In the interior, the altitude makes the climate bearable and often good. Farther south, in the part beyond the tropic, the climate is generally better adapted to Europeans. The rainfall is probably over 40 in., except in Gazaland. Much of the country is covered with forests, yielding rubber, gums, wax, orchid, ivory, and oleaginous seeds. Coffee, sugar, tobacco, fruits, and cotton are cultivated; and gold is mined round Massikessi. The exploitation of the country is entrusted to three chartered companies, in which there are important British interests. Beira and Lourenço Marques are termini of railways from Rhodesia and the Transvaal. The commerce of the ports consists mainly of goods in transit, and takes place chiefly with the United Kingdom, India, France, and Germany. Rubber, sugar, ores, wax, ivory, timber, oleaginous seeds, and fruits are exported in return for cotton textiles, tissues, hardware, railway material, and alcohol. *Lourenço Marques* (14,000) is the capital and chief port; and *Beira* (9,000) is the second port.

Mails and Time. Mails are dispatched to Cape Colony generally every Saturday. Cape Town is distant 5,979 miles from Southampton, and the time of transit is about sixteen days. The time in use in South Africa is two hours in advance of Greenwich time.

Position, Area, and Population. The greater part of North America lies between the Arctic Circle and the Tropic of Cancer, and, except for a narrow isthmus to the south, is surrounded by water—the Pacific Ocean washing its western, the Arctic its northern, and the Atlantic its eastern shores. Its breadth along latitude 50° N. is approximately 3,200 miles, and its length on the meridian of 80° W. Long. approximately 4,300 miles. In area the continent exceeds 8,000,000 square miles, and its population is estimated at about 140,000,000. Most of the inhabitants are of European descent, the remainder being composed of negroes, American Indians, and half-castes. English is the predominant language, though in Quebec French is prevalent, and in Mexico Spanish is the prevailing tongue.

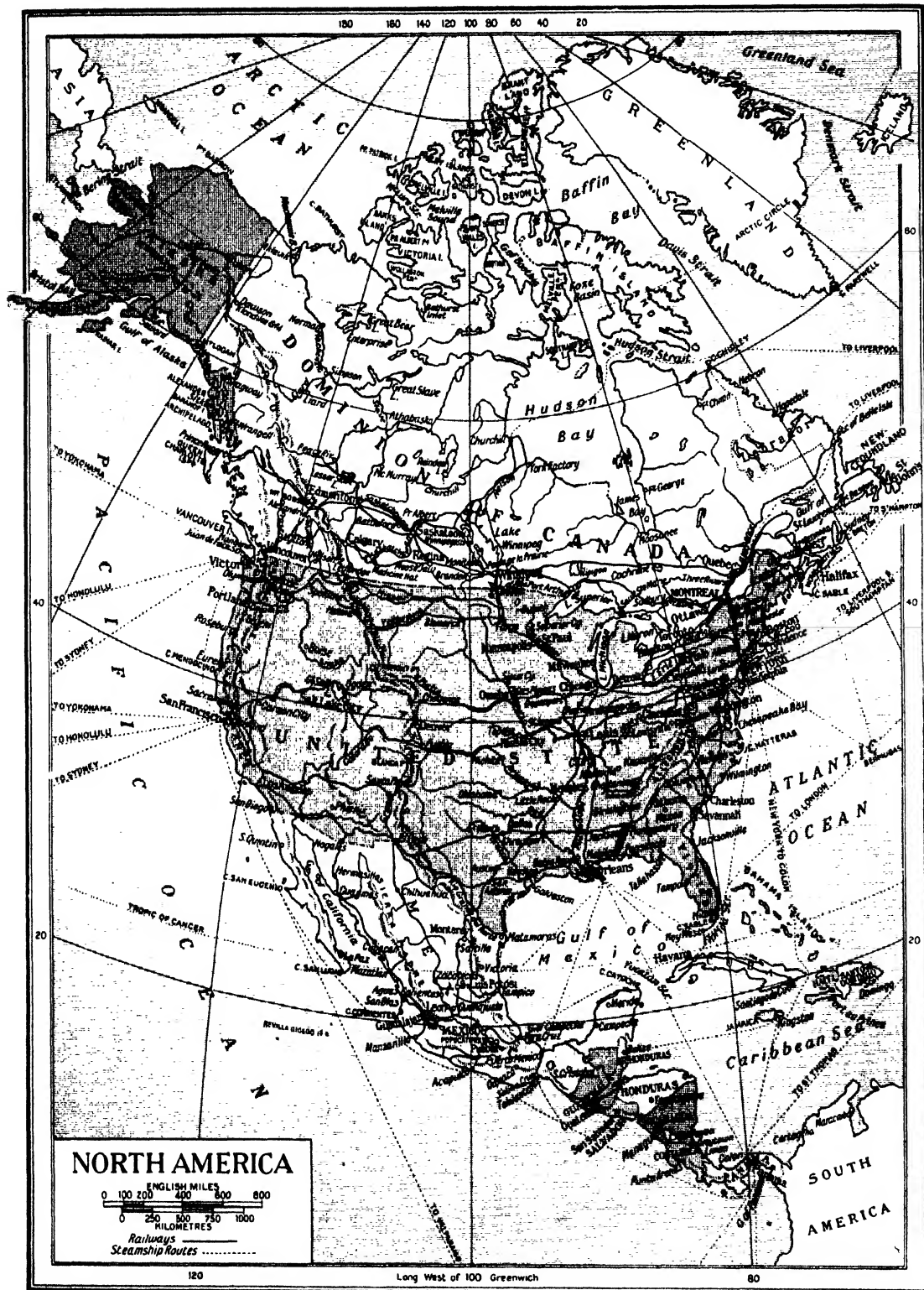
Coast Line. The coast line of the continent is irregular, and, neglecting minor indentations, measures 47,000 miles. It is more developed than that of any other continent; includes more islands than any other continent; and yet is the most compact of the northern continents. Forty per cent of the continent is within 150 miles of the sea, and 80 per cent is not more than 500 miles distant. The triangular shape of the continent and the large Mexican and Hudson gulfs reduce the maximum distance from the sea to not more than 1,000 miles.

Relief. North America consists of two great mountain masses, one in the east and the other in the west, and between them a vast plain extending northwards from the Gulf of Mexico to the Arctic Ocean. The Western Highlands (young fold mountains, still unfinished), or the Cordilleran area, are a highly complicated group of mountain chains, interspersed with wide tablelands. They are widest in the latitude of San Francisco and Denver, where they are about 1,000 miles across. Long, high ranges border the plateaux on both the east and the west, the Rockies on the east, the Cascade and Sierra Nevada mountains on the west. The Great Basin, an inland drainage area containing the Great Salt Lake, lies between the Rockies and the Sierra Nevada, and attains a greater average height than any other portion of the Western Highlands. The valley of the St. Lawrence divides the Eastern Highlands into two main divisions—the Laurentian or Canadian Shield in the north, and the Appalachian system in the south. The Laurentian Shield consists of low or swelling ground, which reaches the elevation of a mile only in the east of Labrador. It is an ancient fold-land, long stable, and undisturbed, covered with very thin soil, etched merely by the rivers, and often exposing large areas of bare rock. Its edge is marked by a long chain of lakes, from Great Bear Lake on the Arctic Circle to the five great lakes—Superior, Huron, Michigan, Erie, and Ontario. The Appalachian Highlands, which extend from Newfoundland almost to the Gulf of Mexico, are old residual heights carved by erosion. They consist of a series of ridges and valleys, and have not half the length, breadth, or height of the younger, western Cordilleran region. Between the Appalachians and the Atlantic coast lies the Atlantic Coastal Plain, narrowing in the north-east but widening southwards to 200 miles. The Central Lowlands are a series of plains and low plateaux covering an area about twenty times that of the British Isles. They slowly sink from an elevation of 5,000 ft. or 6,000 ft. at the base of the Cordilleras

to the trough of the Mackenzie, Mississippi, and the Great Lakes, and gradually rise to the Eastern Highlands.

Within the Central Lowlands lie the chief American rivers and lakes. The lakes along the edge of the Canadian Shield are wide, shallow pans, due largely to past glaciation. The Great Lakes drain to the Atlantic by the trench of the St. Lawrence, and the other Canadian lakes to the Arctic by the Mackenzie, and by several other rivers to Hudson Bay. To the Arctic Ocean or the Gulf of Mexico is carried the main drainage of the plains. The Mississippi-Missouri system (4,220 miles) provides about 16,000 miles of navigable waterways for the greater part of the year, the Mississippi affording continuous navigation up to the Falls of St. Anthony and the Missouri to Great Falls at the foot of the Rockies. By the St. Lawrence and its canals, sea-going vessels can reach Port Arthur and Fort William, and the largest ocean liners can reach Montreal, a thousand miles up the waterway. The Hudson-Mohawk system is of very great commercial importance, as it provides the only deep-water passage through the Appalachians, and comparatively easy gradients for the railways.

Climate and Vegetation. The climate includes every range from tropical to polar, and only equatorial conditions are wholly absent. Most of the continent is within the range of the westerlies, which bring warmth, clouds, and moisture from the Pacific, cross the Cordilleras and descend to the plains as denser, warmer winds, greedy for moisture, and leave the east coast usually as cold winds. Their passage is marked by cyclonic storms wherever the surface varies in elevation or alternates between land and water. As in all the other continents, the pressure is relatively high in winter and low in summer. The winter winds are, therefore, outflowing cold, dry winds, and the summer winds inflowing moist ones. Over the greater part of the continent the rainfall is greatest in the summer months; but the west coast from 32° N. Lat. northwards, the region north of the Gulf of Mexico, and the whole of the east coast, receive winter rains. Throughout the year the central regions receive the least rain; a belt of land from the Gulf of California to the Barren Lands has a very low rainfall. In summer the hottest region is the south-west; in winter San Francisco has a temperature of 50° F., while in the Mackenzie basin there are 50° to 60° of frost. Ten climatic provinces may be distinguished: (1) the Arctic, with low rainfall, and frost for the greater part of the year; (2) the cool, wet western coastal lands north of about 45° N., which provide a climate of infinite diversity, and the best stimulus to human endeavour, both mental and physical; (3) the British Columbian Mountain Province, with low rainfall and cool or cold temperature; (4) the North Canadian, cool, dry province, east of the Rockies, characterized by a great range of temperature; (5) the Californian Province with a "Mediterranean" climate; (6) the western plateau province with little rainfall and great daily and annual ranges of temperature; (7) the prairie province of warm summers with slight rains and cold winters; (8) the eastern warm, wet province with rains at all seasons; (9) the tropical Cordilleran Province of zenithal rains; and (10) the Florida province with equable temperature, and rain at all



times of the year, but heaviest during the summer months.

Greenland and many of the Arctic islands are ice deserts, perpetual sheets of ice and snow practically devoid of vegetable life. The northern borders of the continent with the adjacent islands form the Barren Lands, with the tundra vegetation of stunted perennials and brilliantly-coloured annuals. Further south stretches the Northern Coniferous Forest in a belt (of 600 miles average width) from the Atlantic to the Pacific, the chief trees (of little value, except for wood-pulp) being the spruce, fir, larch, pine, balsam, and birch. Coniferous forests also clothe the British Columbian coastal districts. On the wet east coast the coniferous forest is mixed with the deciduous oak, elm, ash, maple, and hickory; and in the eastern United States the natural formation is broad-leaved forest. The Central Lowlands are mainly prairie grasslands, varying from scrub in the lee of the Rockies to parkland near the Appalachians. On the arid plateaux and basins of the west there is a semi-desert vegetation of scrub, the characteristic plant being the sage-brush, while towards the south thorny cacti and yuccas are common. The hot coasts of Mexico have a tropical vegetation, chiefly jungle forest on the wetter east coast and savanna on the drier west.

Economic Conditions. Before the European colonization little had been done to develop the resources of North America. Mining, fur-hunting, and lumbering engaged the first settlers. As the clearing of the forests proceeded, more land became available for agriculture. The unsuitability of the sub-tropical climate of the south-east for European labour led to the importation of slaves from Africa to cultivate the cotton, rice, and sugar plantations. The nineteenth century saw the development of the railways, the opening up of the prairies, the exploitation of the mineral, pastoral, and agricultural wealth of the west, the discovery of coal and iron in the east, and the rise of great industrial centres round the unrivalled waterways. To-day, North America ranks high in manufactures; leads in the mining industry; is developing scientific agriculture to meet the demands of its growing population; and has few regions unexplored.

Agriculture is the leading industry, but intensive agriculture is evident only in the more populous areas. The continent produces more than a quarter

of the world's wheat and oats; more than three-quarters of the maize; two-thirds of the cotton, and a quarter of the tobacco. It possesses a quarter of the horses of the world, one-fifth of the cattle, and one-ninth of the sheep.

In the fishing industry America stands second only to Europe. Its fisheries are carried on off the eastern coasts of Canada and the United States, on the Great Lakes, and in the coastal waters and rivers of the north-west. The hunting of fur-bearing animals is still important in the northern tracts of Canada. Lumbering is a prime occupation in Eastern Canada, British Columbia, and the east and west of the United States.

Mining is of great importance. All kinds of minerals are found, and with a few exceptions, such as tin, in large quantities. An estimate of the annual mineral wealth of the world gives to the United States about one-half. The continent as a whole produces one-third of the world's coal; more than one-third of the world's iron ore, pig iron, and steel respectively; two-thirds of the copper; about one-third of the silver, lead, and zinc; a quarter of the mercury; and the major share of the world's petroleum.

The complex manufacturing, commercial, and financial activities of modern civilization have attained very high development in the east of the continent, and the United States leads the world in bulk of manufactures. Communications have reached a satisfactory stage of development, and are rapidly being improved, and a world-wide commerce places the majority of Americans in close relations with the rest of the world.

Political Divisions. North America is divided politically into: (1) British North America, consisting of the federal Dominion of Canada, Newfoundland, and the Bermudas, which forms a part of the British Commonwealth of Nations; (2) the federal republic of the United States with Alaska; (3) the federal republic of Mexico; and (4) Greenland, a Danish colony.

Time. There is a difference of 4 hours between the time in the east and that in the west (15 degrees of longitude necessitate an allowance of 1 hour). The conventional times are those of Newfoundland, New York, Chicago, Denver, and San Francisco, respectively 4, 5, 6, 7, and 8 hours behind Greenwich time, each of these extending over a well-defined zone.

Position, Area, and Population. The Dominion of Canada includes the whole of the northern half of North America with the exception of Alaska, Newfoundland, and Labrador. Its total area is 3,690,643 square miles (30 times the area of the British Isles), and its population approximately 10,354,000. The provinces and boundaries into which it is divided are—Prince Edward Island (2,184 square miles; 88,000 population), Nova Scotia (21,428; 513,000), New Brunswick (27,985; 408,000), Quebec (594,434; 2,874,000), Ontario (412,582; 3,432,000), Manitoba (251,832; 700,000), Saskatchewan (251,700; 922,000), Alberta (255,285; 732,000), British Columbia (355,855; 694,000); Yukon (207,076; 4,000); and the North West Territories (Franklin, Keewatin and Mackenzie; 1,309,682; 7,000). About 55 per cent of the population is British; 25 per cent French (mainly in Quebec); 12.5 per cent various European races; and the remainder Asiatics, Red Indians, and Eskimos. Though predominantly an agricultural country, Canada has an urban population of 4,500,000. The most thickly populated parts are the old settled districts in the east, especially the so-called Lake or Ontario "Peninsula," and along the main trans-continental railway routes. Canadians are optimistic in their prophecy that the growth of Canadian population in the twentieth century will, at least, rival that of the United States in the last century.

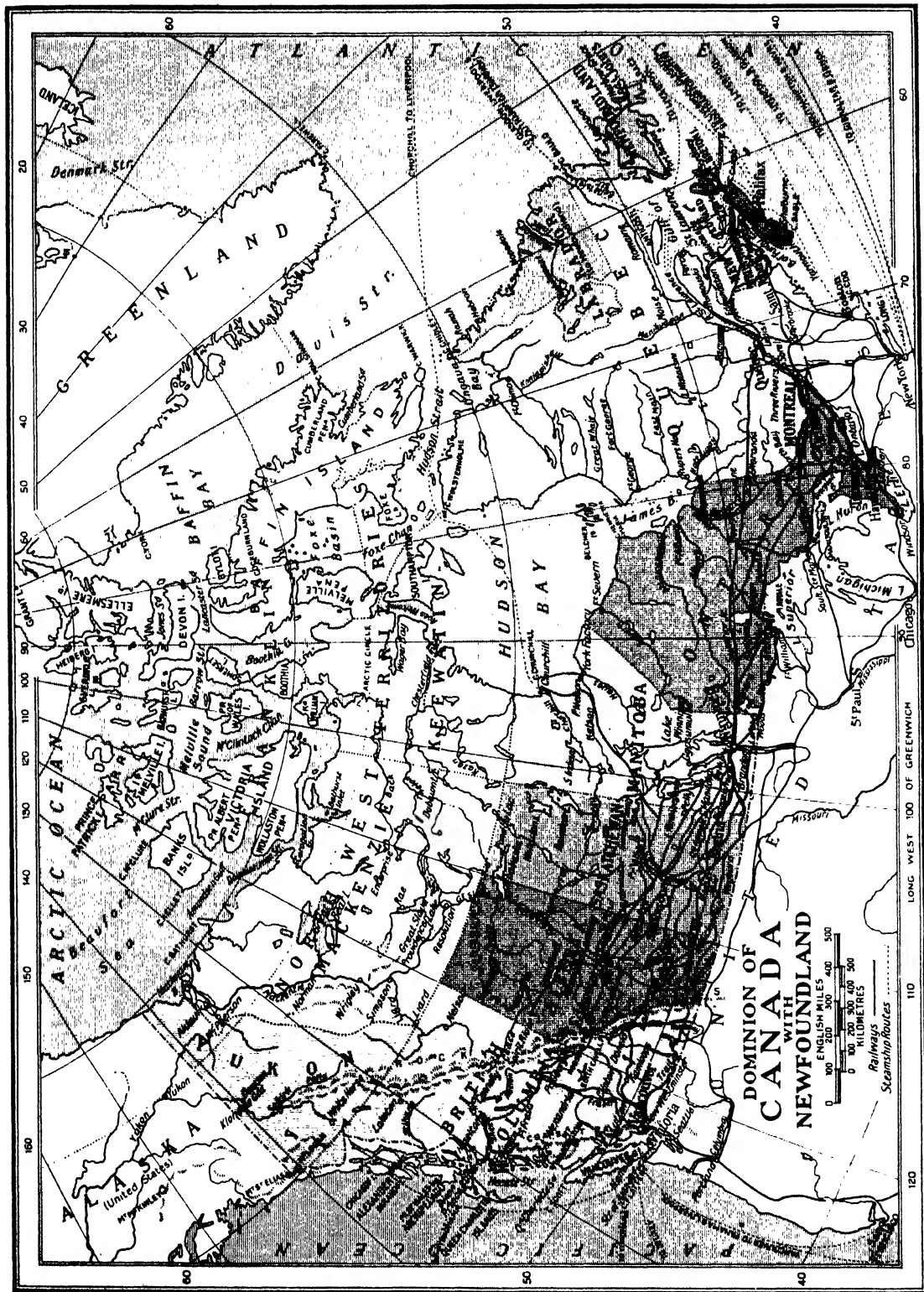
Coast Line. The northern coast is much indented, and is noteworthy for its numerous Arctic islands, of little utility to-day. Hudson Bay penetrates far into the land, extending southwards to within 300 miles of the northern shores of Lake Superior. It is, in reality, an inland sea, and a submerged portion of the Great Plain which stretches to the Gulf of Mexico. Hudson Strait (400 miles long) connects it with the Atlantic Ocean, and forms part of a trade route of growing importance. On the east the most conspicuous opening is the Gulf of St. Lawrence, a pear-shaped sea, 700 miles in length, bordered on the east by Newfoundland and Cape Breton Island, and containing within it Prince Edward and Anticosti Islands. Both the Gulf of St. Lawrence and the Bay of Fundy (famed for its high tides) are drowned portions of former plains, and hence the eastern coast possesses valuable harbours. Montreal, St. John, and Halifax have excellent accommodation for shipping. The Pacific Coast is generally high and rocky, and is noteworthy for its extremely irregular outlines, its many fiords, and its off-lying islands (Vancouver and Queen Charlotte Islands).

Relief. Canada falls into five main natural regions: the Acadian Region, the Lowlands of the St. Lawrence, the Laurentian Plateau, the interior plains, and the Cordilleran or western mountain region. The Acadian Region includes the Maritime Provinces, together with the south-western part of Quebec. It is a rolling country of hills and ridges, with numerous small lakes and river courses, broken by rapids and waterfalls. The Lowlands of the St. Lawrence Valley embrace that portion of Quebec lying between the Laurentian Plateau on the north and the Appalachian Mountains on the south-east, and the port of Ontario between Lake Ontario and the Laurentian Plateau, including the broad peninsula to the west. They support half of the

population of Canada. The Laurentian Plateau or Canadian Shield, a great V-shaped area of Archaean rocks, takes up nearly one-half of Canada. It includes all the land lying north of the St. Lawrence Lowlands up to and surrounding Hudson Bay, and reaches over on the west almost to the Mackenzie River. The Shield consists of low or swelling ground, often soilless and sterile, and dotted with innumerable lakes, the result of past glacial action. Lying between the Muskoka section and Hudson Bay is the Great Clay Belt of Ontario, as yet almost covered with forest growth, but gradually being converted into farm land. The interior plains and undulating lowlands, lying between the western edge of the Shield and the foothills of the Rockies, are, economically, Canada's greatest natural asset. They divide from east to west into three steps or levels. The first level, which lies wholly in Manitoba, is about 800 ft. above sea level, and contains the exceptionally fertile Red River Valley. The middle prairie, less rich and more irregular than the first, has an elevation of about 1,600 ft. at its western limit, the Missouri Côteau; and the third, the most diversified of all, has an elevation of 3,000 ft. at the Rockies. In the west the Cordilleran System (400 miles in width) forms the backbone of North America, and attains its greatest height in Mt. St. Elias (18,024 ft.), and Mt. Logan (nearly 20,000 feet). From east to west the mountains, decreasing in height, are the Rockies (average width 60 miles), the Selkirks, and the Coast Range.

In waterways Canada is exceedingly favoured. To the Atlantic flows the St. Lawrence River (1,900 miles), the commercial highway of the East; to Hudson Bay the Saskatchewan-Nelson (1,900 miles); to the Arctic Ocean, the Mackenzie (2,500 miles); and to the Pacific, the Fraser (7,500 miles). Lakes are numerous. The most notable are the five Great Lakes, Superior, Huron, Michigan (U.S.A.), Erie, Ontario, the most magnificent series of fresh water lakes in the world.

Climate. Canada exhibits many types of climate, but over the greater portion of its immense area a continental climate prevails. Six great climatic regions may be distinguished: the Maritime Provinces; Quebec and Ontario; the Prairie Provinces; the North-West Territories; the Plateaux Region of British Columbia; and the narrow Pacific coastal belt. The climate of the Maritime Provinces differs from that of Quebec and Ontario in its more humid nature (annual precipitation 40 to 50 in.), its shorter springs, and its longer summers. Quebec and Ontario have heavier snowfalls and more continental conditions. In the Prairie Provinces the climate is typically "steppe." The normal annual precipitation of Manitoba is approximately 22 in.; of Saskatchewan, 16 to 17 in.; and of Alberta, 17 to 18 in. Temperature conditions may be gauged from the mean January and July temperatures of Winnipeg (−7°F.; 66°F.), Edmonton (6°F.; 62°F.), and Calgary (12°F.; 60°F.). A feature of the climate of Southern Alberta is the effects of the moist Chinook winds from the Pacific, which are forced up the western slopes of the Rockies, and descend the leeward slopes warm and dry. They keep the prairies of Alberta almost bare of snow in winter and quite bare in the early spring, and by their warmth allow the cattle to feed on the grasslands



even in winter. The North-West Territories generally possess the Arctic climate; while the Plateaux Region of British Columbia has a small annual rainfall (15 in. and under), and continental conditions on the higher uplands. The Pacific Coast Region has a typically oceanic climate, with small range of temperature, and great rainfall (40 to 100 in.) and humidity. Though the Canadian winters are very severe, the dry, crisp atmosphere mitigates the effect of the cold upon men and animals, and tends to invigorate.

Productions and Industries. The natural resources of Canada are very great, and are being steadily developed. An area of over 60,000,000 acres is devoted to crops, chiefly wheat, oats, and barley. In wheat exportation Canada stands first. Its cattle number 9,000,000; its sheep 3,750,000; its pigs 4,400,000; its horses 3,400,000; and its poultry 61,000,000. Forests, coniferous and deciduous, cover over 1,150,000 square miles, and Canada ranks among the greatest exporters of timber, and is the world's chief producer of newsprint. The annual value of the fisheries—notably salmon, cod, lobsters, and halibut—is over £11,000,000. In mineral products, the Dominion produces 90 per cent of the world's nickel; 85 per cent of the asbestos; 55 per cent of the cobalt; 9 per cent of the gold; 6.4 per cent of the zinc; 8.7 per cent of the lead; 8.4 per cent of the silver; and 4 per cent of the copper.

Agriculture. Agriculture is the chief occupation of the Canadians, and the raising of cereals—especially wheat—is of high importance. Only a very small percentage of the possible tracts is cultivated, but the rapid increase in population suggests great future growth. The wheat acreage is over 25,000,000 (95 per cent spring, and 5 per cent winter wheat). Saskatchewan, Manitoba, and Alberta lead in production, the normal yield being about 400,000,000 bushels. In the East, winter wheat cultivation has declined in favour of mixed farming. Oats, barley, maize, flax, alfalfa, tobacco, potatoes, beet, and roots are largely grown. Oats are raised in all the farming regions, but the crop is of most importance in Ontario and Prince Edward Island. Tobacco and maize flourish in the Lake "Peninsula." Southern British Columbia is a fine fruit country, producing apples, pears, plums, cherries, peaches, grapes, nectarines, apricots, and small fruit. Apples constitute the principal and staple fruit crop of Ontario. Peaches, pears, grapes, and plums are grown in the Lake "Peninsula." Nova Scotia is celebrated for its apples, which are produced in Hants, Kings, Annapolis, Cumberland, Pictou, and Yarmouth counties.

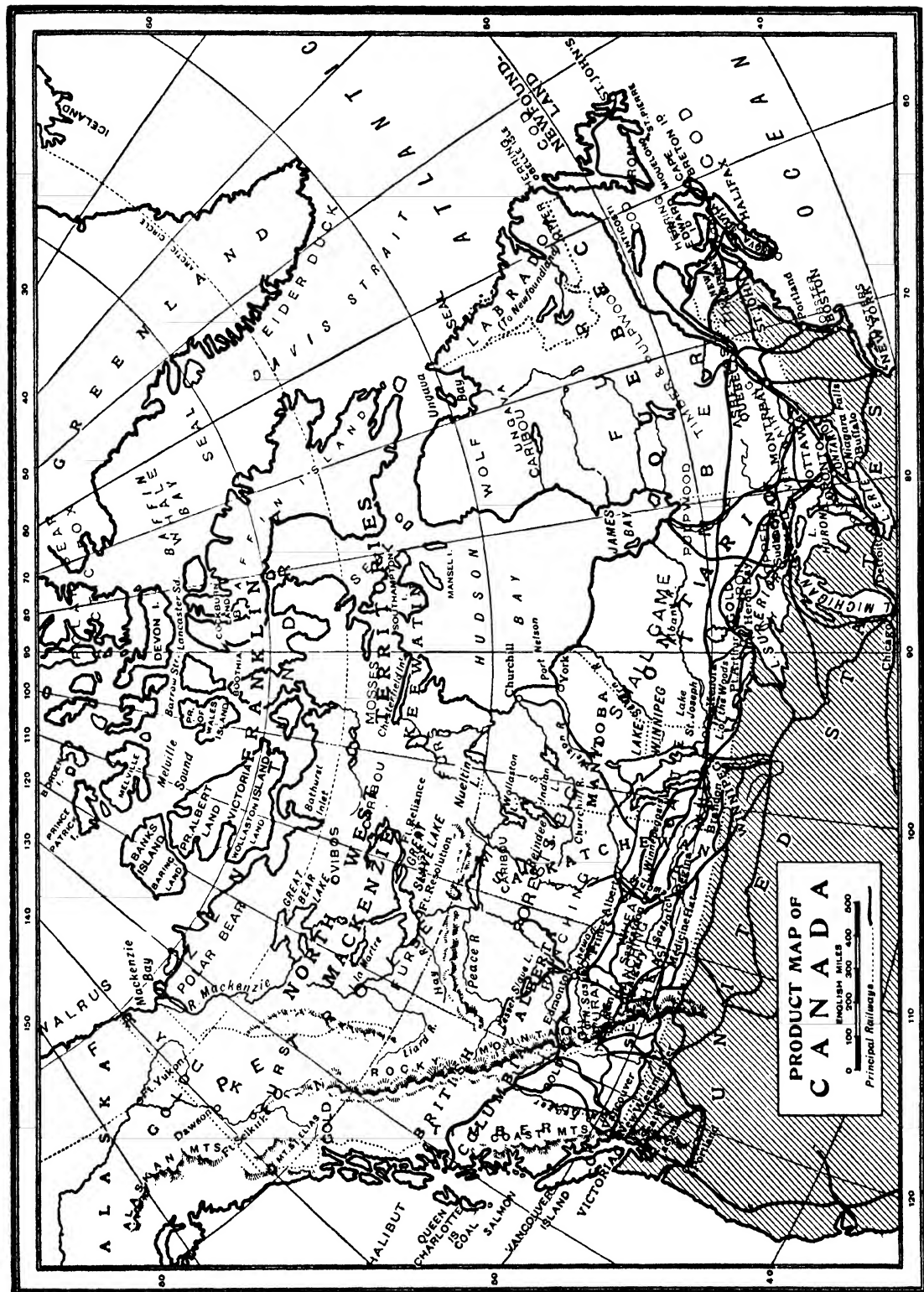
Southern Alberta is a typical ranching region, and Eastern Canada finds dairying very profitable. In Manitoba, Saskatchewan, Alberta, and British Columbia, diversified farming is gaining in importance. Cheese and butter factories are to be found throughout the country—in the East at close intervals—and to these most of the farmers send their milk. The cheese industry is growing rapidly, and nearly all the cheese is shipped to British markets. Poultry-raising promises great extension. The Eastern Provinces find excellent markets for poultry and eggs in the United States and Great Britain.

Lumbering. The forest portions of Canada

amounts approximately to 600,000,000 acres. East of Winnipeg, almost the whole of the land, which is now under cultivation, was once covered by a heavy growth of timber. From the Atlantic to the Pacific, with a width varying from 200 to 300 miles, stretches the vast sub-Arctic forest, composed largely of white and black spruce. Deciduous forests with trees of many species are found in the Maritime Provinces, Quebec, and Ontario; coniferous forests with trees of great size (the Douglas fir of British Columbia often attains a height of 300 feet, and a girth of 50 to 60 feet) on the wet Pacific slopes; and intermittent forests occur north of the prairies. Advantageous factors in lumbering are the hard frosts and snow of winter, which aid in haulage; the water-power and means of communication provided by the numerous streams; the excellent quality of much of the timber; and the labour set free from the prairie farms when winter approaches. The wood-pulp and paper industry is of great importance. Of famous "timber streams," the Ottawa, Saguenay, and St. John, are among the chief; and Ottawa is the leading lumber centre. The chief timber trees are pine, oak, elm, maple, beech, birch, ash, Douglas fir, cedar, hemlock, and poplar.

The Fur Industry. The whole of the northern and north-eastern parts of Canada are the resorts of the trapper and the Hudson Bay trader. The great Hudson's Bay Company retained its rights of trading when it sold its vast territory to the Dominion Government. Its posts reach from the stern coasts of Labrador to the frontiers of Alaska. Fur farms, mostly in Prince Edward Island, are steadily increasing, the greatest success being achieved with foxes. Among the most important fur-bearing animals are the beaver, bear (black and brown), musk-rat, marten, fisher, otter, fox (black, red, and white), lynx, mink, skunk, racoon, and wolverine. Travel in the great fur country is by dog team and snow shoes in the long winter, and by canoe along the great rivers and lakes in summer. The furs are conveyed to Fort Churchill on Hudson Bay, and by the Company's steamers to Britain, during the few months of safe navigation in Hudson Bay and Strait. Montreal is an important fur market.

Fishing. The fisheries are of prime importance, and may be divided into: the Gulf of St. Lawrence and Bay of Chaleur; the Bay of Fundy; the Great Lakes; the rivers and coast of British Columbia; the Grand Banks; and the Labrador. The Gulf of St. Lawrence and Bay of Fundy fisheries are among the oldest and most important, ranking among the great fisheries of the world. Cod, mackerel, halibut, herring, hake, and salmon are taken in immense numbers. Large quantities of lobsters and oysters are found along the north shore of Prince Edward Island. Lake trout, whitefish, lake salmon, sturgeon, black bass, and pickerel are caught in the Great Lakes. Salmon abound in many of the rivers of British Columbia, the number in the Fraser, Skeena, Stikine, and Columbia rivers being at times amazing. Cod, sturgeon, and halibut are found off the British Columbian coasts, and large numbers of seals are caught on the north coasts. The Great Banks of Newfoundland, a vast submarine plateau extending around the south and east shores of Newfoundland, are covered with a depth of from 10 to 160 fathoms of water, and are the scene of the



greatest cod fisheries of the world, the ships of many nations being engaged in gathering the sea's great harvest. Naturally, the Newfoundland fishermen, with their advantages of nearness and plentiful bait, obtain an important share of the yield. The cod season usually lasts from June to November, and the cod are cleaned, salted, and sun-dried on stages. Off the Labrador Coasts, seal-fishing from the middle of March to the middle of April is important. Steamers and sailing vessels, heavily manned, seek the drifting ice-floes from the north, on which the young seals have been born.

Mining. Canada has great mineral wealth, much of which remains untouched. Coal exists in many regions. Nova Scotia raises about 5,000,000 tons of coal annually, chiefly in Cape Breton Island, and Cumberland and Pictou counties. Central Canada has a vast coal area, whose possibilities have yet to be ascertained. Coal is mined at Lethbridge, Bankhead, and Edmonton in Alberta; and in the Estevan district of South-East Saskatchewan. The largest coal mines of British Columbia are at Nanaimo (Vancouver Island), the Crow's Nest Pass (with Fernie as the centre), Hosmer and Corbin in East Kootenay, and in the Nicola Valley. Queen Charlotte Islands possess extensive coalfields practically unworked. It should be noted that much of the coal is of excellent quality, especially the steam coal of the Pacific areas, but that the prairie coals are largely lignitic. The total annual coal production of the Dominions is about 16,000,000 tons. Iron ore is mined near coal in Annapolis County (Nova Scotia). Large quantities of iron are obtained in Ontario, mainly at Michipicoten, and in Cape Breton Island. Gold is widely distributed. In British Columbia, the most valuable mines are in West Kootenay and the Boundary Division of Yale. The gold of the Klondike gave rise to Dawson City, but dwindling gold resources have caused its decline. In Ontario the gold mines at Kirkland Lake and Porcupine are the second most productive in the world, and Nova Scotia yields small supplies. Silver is mined in large quantities at Cobalt (Ontario), and in several districts of British Columbia. Lead and copper are also important minerals of British Columbia. Copper and nickel (90 per cent of the world's supply of nickel) are mined at Sudbury (Ontario), and Southern Quebec produces 85 per cent of the world's asbestos. Cobalt (Ontario) is a great source of cobalt; and other minerals are the gypsum of Nova Scotia and New Brunswick; the mica, limestone, and marble of Quebec; the Portland cement of Ontario; and the zinc of British Columbia. Petroleum and natural gas occur in several parts of the East and in the southern part of the Prairies.

Manufactures. Canada greatly increased her manufactures during the War, and some not only supply the home market, but export large quantities. The great abundance of water-power, much of which is being utilized, the great stores of raw materials, and an energetic people with leaders of great organizing abilities, are factors promising a very hopeful future. Most of the manufactures are connected with local products, and include wood pulp, paper, cotton, woollen, artificial silk, rubber and leather goods, agricultural machinery, motor-cars, wooden goods, flour, soap, tobacco, iron and steel goods, sugar, and rolling stock. Very large

iron and steel, cement, tar, and chemical works are to be found at Sydney (Cape Breton Island); Montreal has sugar refining and textile factories; Quebec is the chief centre for leather goods; Ontario turns out more than half of the manufactured goods of the Dominion; and salmon and fruit canning are important in British Columbia.

Communications. In nothing has Canada shown a more progressive system than in the development of her means of communication. The Dominion has a larger merchant fleet than any other British Colony. The Canadian Pacific Railway operates ocean steamship to Europe, Japan, and China, on the Great Lakes, and on the Pacific Coast. Large modern steamers are also operated by the Canadian Government. Its Merchant Marine provides a special service from Montreal and Halifax to Bermuda and the British West Indies. The vessels are fitted with cold storage facilities for the carrying of fruits and other perishable products. Aeroplanes and hydroplanes are used for the detection of forest fires and for surveying. There are several isolated routes, which, when connected, will give Canada a valuable system of air routes.

Commerce. The exports of Canada are the products of agriculture, the pastoral industry, mining, hunting, and a few manufactured goods. The chief are wheat, wheat flour, paper, planks and boards, wood pulp, pulpwood, cheese, live stock, barley, apples, fruits, bacon, copper, nickel, gold, silver, asbestos, salmon, cod, lobster, furs, motors, tyres, agricultural machinery, lard, rubber manufactures, leather, skins, and hides. Among the chief imports are iron and steel goods, cotton and woollen goods, sugar, oil, rice, tea, coffee, glass ware, earthenware, apparel, coal, linen, jute, and artificial silk goods, leather goods, spirits, tobacco, drugs, metals, petroleum oils, tropical fruits, spices, and chemicals. Most trade is with the United States (36 per cent of Canada's exports; 68 per cent of the imports), and the United Kingdom (31.5 per cent; 15.3 per cent), followed by the Australasian, African, West Indian, and East Indian Colonies, France, Holland, Germany, Belgium, Japan, Mexico, South America, and China. The chief ports are Montreal and Quebec (summer ports); Halifax, St. John, and Sydney (winter ports); and Vancouver and Prince Rupert (Pacific ports). Portland (Maine), Boston (Massachusetts), and New York act as winter ports.

The Provinces. *Nova Scotia.* Nova Scotia, including the peninsula of that name and the island of Cape Breton to the north-east of it, is about two-thirds the size of Scotland, and has a population somewhat larger than Sheffield. Agriculture is the leading industry, and oats, wheat, and barley the chief crops. Root crops are heavy, and apples reach perfection in the Annapolis Valley. Mining ranks next to agriculture. The coalfields are principally in Cumberland and Pictou counties, and on the Island of Cape Breton (annual return over £5,000,000). Gold, iron, antimony, manganese, gypsum, and rock salt are also mined. The fisheries are of great importance (annual value £2,200,000). Cod, lobsters, haddock, mackerel, and herring form the bulk of the catch. Shipbuilding and lumbering are also important. The chief towns are: Halifax (59,000), the capital, and chief port; Sydney (23,000); and Glace Bay (17,000).

Prince Edward Island. Prince Edward Island,

the smallest province, is about equal in area to the County of Norfolk in England. It is the only part of the Dominion that is fully settled. The breeding of silver black foxes in captivity is an established and profitable industry. Charlottetown (12,000) is the capital.

New Brunswick. New Brunswick joins Maine (U.S.A.) on the east. It is nearly as large as Scotland, and has a population of 408,000. The people are engaged in agriculture, shipbuilding, lumbering and fishing. The chief towns are: Fredericton (8,000), the capital; St. John (47,000), the chief port; and Moncton (17,500), the eastern headquarters of the Canadian National Railways.

Quebec. Quebec, a province of vast size, most of which is forest and wilderness, occupies the lower part of the basin of the River St. Lawrence. Ungava was annexed in 1912. The chief natural production is timber; and the population, numbering nearly 2,875,000, four-fifths of whom are of French descent, live near the River St. Lawrence and in the region between that river and the boundary of the eastern United States. The chief towns are: Montreal (811,000), the commercial metropolis, the greatest manufacturing centre, and the largest city of the Dominion; and Quebec (129,000), the capital.

Ontario. Ontario has an area of 412,582 square miles. The northern half is a wilderness, and the greater part of the population of about 3,432,000 occupies the peninsula between lake Erie, Ontario, and Huron. The land is generally very fertile, and the climate in the south-western part is warm enough to ripen grapes for making wine. Dairying, fruit-growing, mining, and lumbering are very important. The chief towns are: Toronto (628,000), the capital and chief city; Hamilton (155,000), the "Birmingham of Canada," and Ottawa (125,000), the seat of the Dominion Government.

Manitoba. Manitoba (251,832 square miles; 700,000 population) is a thinly-peopled prairie province. The fertile lands of the Red River basin are well suited for wheat culture, and that cereal is the principal product. It is, however, becoming a very important live stock country. Winnipeg (218,000), the capital and chief town, is the world's greatest wheat market.

British Columbia. British Columbia (355,855 square miles; 694,000 population) is a vast western region, having a few towns in its south-western part. Timber is the greatest asset. Throughout the coast region, and, in a lesser degree, the wet belts of the interior, there are great stands of Douglas fir, hemlock, red and yellow cedar, spruce, larch, and commercial pines. The province is second only to Ontario in its mineral wealth. Apples, grapes, apricots, peaches, and plums reach perfection, especially in the Okanagan Valley. The fisheries are the first in value in Canada. The chief towns are: Vancouver (245,000), the western commercial metropolis; Victoria (38,000), the capital; New Westminster (15,000), a lumbering centre; Nanaimo (9,500), a mining and fishing centre; and Prince Rupert (6,400), a rising port.

Alberta. Alberta lies east of the Rockies, and is sheltered by that range. Agriculture is the chief occupation. Wheat, oats, barley, flax, rye, and alfalfa are grown. Mixed farming and dairying are features of the central section, and the raising of

horses, cattle, and pigs is important. Bituminous and anthracite coal are mined (7,000,000 tons annually). Natural gas, under heavy pressure, is found at many points. The most productive petroleum supply is in the Turner Valley. Fur trading is important in the north. Edmonton (79,000), the capital, and Calgary (83,000) are the chief towns.

Saskatchewan. Saskatchewan, lying between Alberta and Manitoba, is a rich agricultural country, the soil being peculiarly adapted for wheat growing. It produces the bulk of the Canadian wheat crop. Dairying and the beef cattle industry are making rapid progress. Regina (53,000), the capital; Saskatoon (43,000), a distributing centre; and Moose Jaw (20,000), are the chief towns.

Newfoundland (42,734 square miles; 272,000 population), the twelfth largest island in the world, is a separate British colony. The coast is rugged, but the interior is said to be fertile. At Grand Falls, Bishop's Falls, and Corner Brook, there are now extensive paper mills in operation. Most of the paper is exported to England; the wood-pulp and paper exports total over £13,000,000 annually. This industry has been developed by the laying of new railways to the centre and north, where magnificent pine forests flourish. With the exception of iron ore, the mineral wealth, though great, is little exploited. The island possesses the third greatest hematite deposit in the world. Much of the trade is with Canada, but the exports of pulp and paper to the United Kingdom are very important. The chief exports are pulp, paper, dried cod, iron ore, seal oil, cod oil, sealskins, and tinned lobsters; and the chief imports are textiles, flour, coal, machinery, hardware, salt pork, tea, and molasses. Most of the population is settled in the south-eastern peninsula of Avalon, where there are five or six towns and villages, of which St. John's (42,000), the largest, is the capital.

Labrador (120,000 square miles; 4,100 population, mostly Eskimos), a dependency of Newfoundland, forms the most easterly part of North America. The greater part of it is a barren waste; but some of the areas are timbered, and pulp and paper mills have been erected at Sandwich Bay, and Hamilton Inlet. Hunting and fishing are the chief occupations. There are no towns, but Hopedale, Hebron, Okak, and Nain are Moravian Mission stations.

The Bermudas, a group of more than 300 coral islands and reefs, some 600 miles east of North Carolina, are a naval station for the British North American Squadron. Only fifteen of the islands are habitable, and on these the soil is thin. The most important are Bermuda, St. George's, Ireland Island, Somerset, and St. David's. They comprise an area of about 19 square miles, and contain a population of 9,000 whites, and 28,000 negroes. There are no fresh water streams, and the wells being poor, the water supply depends on the copious rainfall. Potatoes, onions, lily bulbs, and tomatoes are produced for the New York markets. Americans and Canadians use the islands as a winter and spring resort. Hamilton (2,600), on Great Bermuda Island, is the chief town.

Mails. Mails are dispatched from Great Britain to Canada about three times a week. Ottawa is 3,540 miles from London, and the time of transit is a little over six days.

Position, Area, and Population. The United States of America, the most important Republic in the world, and the foremost manufacturing country, is an almost self-sufficing unit with few political responsibilities, and a future without parallel, its present economic expansion being more rapid than that of any other country. Its position has secured for it freedom from serious international disputes, and given it that peace which is the concomitant of prosperity; and its vast, easily accessible wealth in coal and iron, its abundance of cheap, raw materials, its rapidly expanding home market, its great accumulations of capital, the organizing, inventive, and engineering skill of its people, its high protective tariff, and its large investments in foreign countries have led to its predominance in manufactures, and to its rise to one of the three greatest commercial countries of the world.

The Republic lies between $24^{\circ} 30'$ and 49° N. Lat., and between the meridians 67° and 125° W. Long. Its northern boundary is Canada, America's greatest and unfortified frontier; its eastern is the Atlantic Ocean; its western is the Pacific Ocean; and its southern the unstable, revolutionary Republic of Mexico, and the Gulf of Mexico. The total area (continental) is 3,026,689 square miles (land area, 2,963,774 square miles), with a population of over 122,775,000; but with its various possessions it embraces an area of 3,738,395 square miles, with a population of approximately 138,000,000. Immigration from every European country (the greatest source), and from Asia, Canada, and Mexico, has largely caused the phenomenal growth of its population from 5,000,000 in 1800 to its present huge total. Since 1924 immigration has been restricted, and preference given to the races of North-Western Europe, the immigrants in 1930 numbering only 241,700. To create a true American spirit is a process of time. Individualization has begun, and the Alpine, Nordic, and Mediterranean races are slowly coalescing into an American race. The typical American, the product of several generations, is taller and thinner than the Englishman, with higher cheek bones and narrower hips. He is mentally and physically quick, inventive, keen, and courageous, and has less reverence for law and less conservatism than the Englishman. His opportunities are many, and he is not slow to seize them.

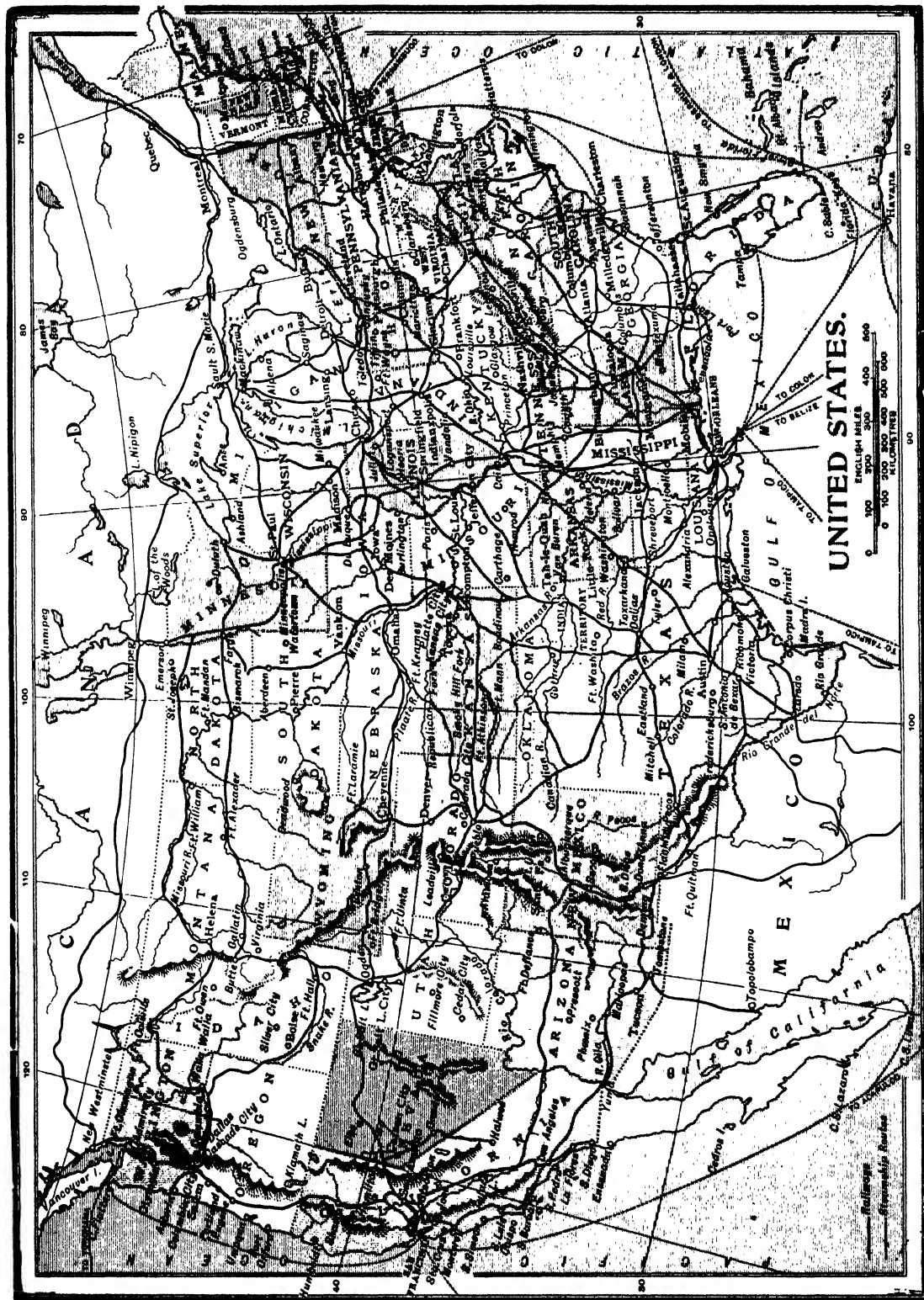
Several problems await solution by the Government. In the south, unsolved problems are presented by the 12,000,000 negroes, who are regarded by the whites as inferior and unfit to take part in the government, and the landless white labourers. On the Pacific Coast yellow immigrants are prohibited and labour is scarce. The control of large trusts, and the reconciliation of the different interests of the varied communities in such a vast area provide other difficulties. In 1898 colonies were acquired, and thus America has the responsibility of uplifting and civilizing inferior races.

Coast Line. The coast line on both oceans has an estimated length of about 15,610 miles, and, in addition, there are 3,600 miles on the Great Lakes, and 5,744 miles on the Gulf of Mexico. The western coast is singularly unbroken, offering poor facilities for harbourage, except in the case of San Francisco and the mouth of the Columbia River. The drowned coast of British Columbia, however, is of

very great direct value, facilitating a continuous interior water passage between the Puget Sound ports and the ports of Alaska. North of 41° N. Lat., the Atlantic Coast is markedly irregular, especially in Maine, and excellent harbours are found at Portland, Boston, and New York. Southwards from Long Island, the shore is for the most part low and flat, and fringed with sand reefs; and only the deep Delaware and Chesapeake Bays penetrate into the interior. The Gulf Coast is generally low, swampy, regular, and harbourless, except for the small harbour at Mobile, and the harbour at Galveston, developed largely at Government expense, and that at Houston, which, though 50 miles inland, now has a 30 ft. channel and is rapidly superseding Galveston as a port. New Orleans, the chief port, lies 100 miles up the Mississippi River.

Relief. Physically, the United States consists of: The Pacific Highland on the west extending from north to south, a broad and continuous mass of high country with young folded mountains, subject to volcanic activity and earthquakes, and rich in mineral wealth; the Great Plains in the centre; and the Atlantic Highland with its coastal plain. The lofty ranges of the Sierra Nevada in the south, and the Cascade Mountains in the north, rise to heights of 12,000 ft. to 15,000 ft. Beyond the Sierra Nevada lies the Coast Ranges, and between the two systems is found the beautiful Valley of California in the south and the Willamette-Puget Sound trough in the north. The Rockies include the Bitter Root Mountains of Idaho, the Bighorn and Laramie Ranges of Colorado and the Belt Mountains of Montana. From the western edge of the Great Plains the front range of the Rockies rises from a base of 4,000 ft. or 6,000 ft. to summits of 10,000 ft. and 14,000 ft. Between the Wasatch Mountains and the Sierra Nevada lies the arid Great Basin (210,000 square miles), a region of inland drainage. The Great Plains may be divided into the Gulf Plains, the Prairies, the High Plains, and the Lake Plains. The Gulf Plains, lying along the Gulf of Mexico, extend up the Lower Mississippi till a height of 500 ft. is reached. The Prairies (500,000 square miles), stretching from Mexico to the Great Lakes, are wide, open, treeless plains, and are rather smooth land with shallow valleys. Their soils, highly suitable for cereals, are extremely fertile and of fine texture, many of them being of glacial origin. Westwards of the hundredth meridian, the Prairies pass into a higher and drier region, rising between the Arkansas and Platte Rivers to 6,500 ft., and ending abruptly at the foot of the Rockies; these plains are aptly termed the High Plains, and provide good grazing land. The Lake Plains, lying south of the Great Lakes, have a more ample rainfall than the Prairies, and are generally tree-covered. On the east the Appalachian Mountain System displays in the north a series of isolated north and south ridges, but in the south is a distinct mountain mass. It long acted as a barrier against western migration from the coastal plain to the Prairies. The New England States comprise a rugged upland of hard, ancient rock with peaks rising to 5,000 ft. and 6,000 ft.

Climate. Many types of climate occur—the Mediterranean in California, the West European in Washington, the arid Continental in Arizona, the Continental in the Middle North, the coastal in



Florida, and the West Atlantic in Maine. Passing from north to south in the plains region, cold temperate, warm temperate, and sub-tropical climates occur. The absence of mountains on the north allows the cold Arctic winds to sweep over the Prairies, and the climate of the coastal plain is modified by its nearness to the Atlantic waters. From the Gulf of Mexico winds blow into the interior; but the Pacific winds, obstructed by the western mountains, drop their moisture on the western slopes, thus reaching the Great Basin as dry winds. The Appalachians are not a very formidable barrier to the winds from the Atlantic, and so the Great Plains derive some of their moisture from this source. On the Pacific coast the annual rainfall is in parts 60 in., in the Great Basin 5 in., on the western slopes of the Rockies 30 in., on the High Plains 10 to 20 in.; while the annual rainfall of the Prairies ranges from 18 to 30 in., and that of the Atlantic Coastal Plain from 40 to 45 in. All the country east of the hundredth meridian has usually an adequate rainfall for crop production. The mean annual temperature of the country ranges from 75° F. in Southern Florida and Texas to less than 40° F. in the Lake Superior region. On the basis of temperature, the whole country divides approximately into three regions: (1) warm regions, having an annual mean temperature of 60° F. and above, including the southern part of the Coastal Plain and the Gulf Plains, Southern Arizona, South-west Mexico, and a great part of California (excepting always the mountain regions); (2) temperate regions, with an annual mean temperature of 50° F. to 60° F., including the Middle Atlantic States, the Ohio Valley, Southern Indiana and Illinois, Missouri, Kansas, Oklahoma, South-east Colorado, and most of the Pacific Coast States; and (3) cold regions with an annual mean temperature of 40° F. to 50° F., including Northern Indiana and Illinois, Iowa, Nebraska, South Dakota, Wyoming, the mountain districts of the west, and the northern states.

Communications. The United States possesses over 20,000 miles of inland navigable waterways. The united stream of the Missouri-Mississippi, 4,220 miles, brings the temperate north in close touch with the sub-tropical south. In its basin there are 16,000 miles of navigable river. The Mississippi itself is continuously navigable for steamers drawing 6 ft. to the Falls of St. Anthony, and several canals connect it with the Great Lakes. River traffic, which was very important before the railway era, has now declined; but the Mississippi is still an auxiliary and rival of the railways in spite of its bars, the fluctuations in the depth of its channel, and its destructive floods. The Ohio River, a tributary of the Mississippi, has more traffic than the parent stream; over 15,000,000 tons of freight per annum are carried on it. With the exception of the Hudson River, the Appalachian rivers are important only in their lower courses across the Coastal Plain. The Hudson River crosses the Appalachian Barrier from north to south, and is navigable for ocean steamers for 100 miles. As a freight carrier it vies with the Ohio. On the west, the Columbia, navigable with some interruption for 250 miles, is the great river. The Great Lakes with the St. Lawrence River give a water route extending inland 2,000 miles from the sea. All the lakes (except Ontario)

and their connecting channels have a minimum depth of 21 ft., and are used by vessels drawing 20 ft. of water. The great drawback is the closing of the St. Lawrence River by ice from early December to late April. The New York State Barge Canal, laid through the Mohawk Valley, connects the navigation of the Great Lakes with New York. It starts from Buffalo and proceeds eastwards to Troy and Albany. It accommodates boats drawing 12 ft. of water, but the traffic is slight and its abandonment by the State is contemplated. The Champlain Canal connects its eastern end with Lake Champlain; and the Hudson River completes the waterway to New York. Between Lakes Superior and Huron is the St. Mary's falls Canal ("Soo"), which avoids the Sault St. Marie Rapids; it is a most important gateway of trade, the traffic through it being much greater than that through the Suez or Panama Canals.

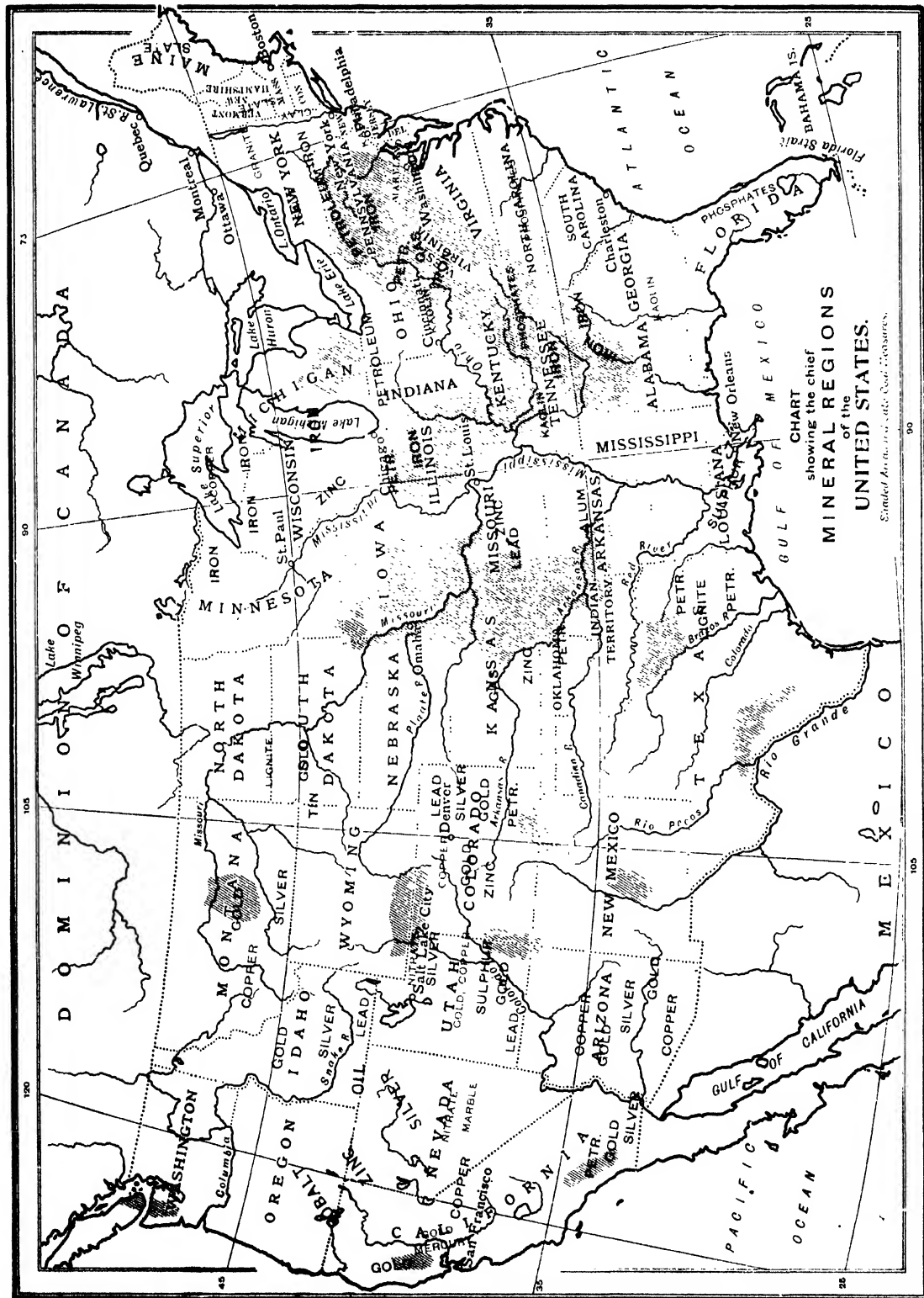
Air routes connect all important towns and cities, and New York has an air service with Rio de Janeiro and Buenos Aires. The railways (262,225 miles) have been described on page 11.

One of the most remarkable achievements of the past quarter of a century is the development of a net of hard-surfaced highways. Out of a total of over three million miles of road, which is nearly 50 per cent of the world's total, more than 600,000 miles have been improved, permitting year around traffic. Nearly 60,000 miles are of concrete. New York State alone builds about 1,000 miles of concrete highway annually. This vast highway development has caused a rapid decline in the amount of freight and in the numbers of passengers carried by the railroads, so that the latter are having difficulty in operating at a profit.

Productions and Industries. *Agriculture.* Agriculture is the most important occupation. There are slightly over 6,000,000 farms of which nearly 40 per cent are between 100 and 500 acres; about 23 per cent between 50 and 100 acres; and 25 per cent between 20 and 50 acres. The Republic raises three-quarters of the world's maize, one-quarter of the wheat, and more than half of the cotton and tobacco. The chief agricultural crops, showing acreage, production, and leading state are listed below (figures given in millions).

Crop	Acreage	Production	Leading State	Percentage of Total
Maize . . .	101	2,740 bu.	Iowa	15
Wheat . . .	56	890 bu.	Kansas	17
Cotton . . .	44	14 bales	Texas	31
Oats . . .	43	1,345 bu.	Iowa	16
Barley . . .	8	208 bu.	Minnesota	23
Sorghums . .	6	123 bu.	Texas	45
Rye . . .	4	55 bu.	North Dakota	29
Potatoes . .	3.4	380 bu.	Maine	10
Flax seed . .	3	23 bu.	North Dakota	43
Tobacco . .	1.8	1,330 lb.	North Carolina	37
Rice . . .	1	37 bu.	Louisiana	43
Sugar beets .	0.7	7 tons	Colorado	40

Sweet potatoes, soybeans, dry beans, sugar cane, and buckwheat are other crops of importance. In value, wheat is the leading crop, although the exports amount to only 15 per cent of the total yield. Unlike Canada, winter wheat comprises about two-thirds of the production. Spring wheat is grown only in the northern tier of the central states, while



winter wheat is widespread in Kansas, Nebraska, Oklahoma, Missouri, Iowa, and Illinois, and it is not an unimportant crop in Washington, Indiana, Ohio, Pennsylvania, and New York. Maize, the largest single crop, is largely used for feeding farm stock, figuring little in the foreign trade, except in the form of hog products. It is found south of the spring wheat belt on the prairies of Kansas, Iowa, Missouri, Nebraska, Indiana, and Ohio. Rice is mainly cultivated in Louisiana, Arkansas, and California, where the soil is moist and hot. The sugar cane is most extensively grown in the delta lands of Louisiana; while beet-sugar (about one-ninth of the world's total) is produced in Colorado, Nebraska, Utah, California, Idaho, and Wyoming. The most valuable agricultural product is cotton, which is now faced with the problem of the destructive cotton boll-weevil. The cotton belt stretches from the Mexican border to Carolina south of the thirty-seventh parallel of latitude where the growing season is at least 200 days. Everywhere cultivation is by negro labour or by labour-saving machinery. Normally, cultivation is greatest in the areas most densely populated by negroes; but on account of the ravages of the boll-weevil the chief producing region is now in Texas, cotton having invaded a region formerly occupied by semi-arid pasture. The chief cotton-growing centres are: (1) The Black Prairie of Texas, round Wichita Falls, Dallas, and Austin, extending northward into Oklahoma. (2) The Mississippi Bottoms of Tennessee, Missouri, and Mississippi. Here the boll-weevil and destructive floods have diminished the output, but Memphis has become the greatest inland cotton market of the world. (3) The Black Belt of Alabama, the chief negro district, with a fine decomposed limestone soil, grows other crops in rotation with cotton, and maintains its output in spite of the boll-weevil. (4) The Piedmont area of the Eastern Appalachians has a climate not altogether suitable for cotton, and other crops (truck) attain a considerable economic value. (5) The "Sea Island" cotton area of the fringing islands and low coastal strips of South Carolina and Georgia has, on account of the activities of the boll-weevil and the more profitable employment of its labour in truck-farming, greatly reduced its output, and the place of the "Sea Island" plantation has been taken by the growth of irrigation cotton in the Salt River District of Arizona, in what was formerly a desert. The continued growth of cotton manufactures in the north and south tends to lessen the amount of cotton exported. Tobacco is cultivated as far north as the Connecticut Valley; Kentucky, North Carolina, Georgia, Virginia, South Carolina, and Tennessee are the chief states. Both pipe and cigarette tobacco are grown—cigarette nearer the sea, pipe more inland. Cigar wrapper tobacco is grown on the sandy soils of the Connecticut Valley on land valued as high as \$1,200 per acre.

The cultivation of fruits is expanding each year due to the changing diet of the American people, which results partly from the systematized advertising of the fruit-growers' associations. Apples make up the largest item of fruit production, the value of the crop in an average year amounting to about \$200,000,000, Washington (producing 14 per cent), New York, and Virginia are the principal producers. Oranges are grown extensively in

California and Florida, lemons in California, and grapefruit in Florida and the Rio Grande lowlands of Texas. Grapes 2,500,000 tons annually are grown largely in California, although New York, Pennsylvania and Missouri grow grapes for the so-called "grape juice." Peaches and pears are grown on a vast scale in California, where the canning of fruits has become a large industry.

The arid and semi-arid regions (1,200,000 square miles), lying between 100° and 120° West Long., can be developed only by irrigation and "dry-farming" methods. Although only a fraction of these regions can ever be irrigated, the oases of the arid west are inviting an ever-increasing population. The federal government is spending vast sums on irrigation projects, the most recent being the Boulder Dam in the Colorado River. Mixed farming and dairying, as might be expected, are largely carried on in New England, New York, and Wisconsin. Market gardening is confined to the large population centres and the fertile loams of the Coastal Plain.

The Pastoral Industry. The chief pastoral regions are the high plains and the plateau states of the West, where the diminished rainfall makes agricultural pursuits impossible or unsuccessful in many parts. Cattle number 55,000,000 (40 per cent are dairy); pigs 55,000,000; sheep, 45,000,000 (about 7 per cent of the world's total); horses, 13,000,000; and mules, 5,000,000. Because of the great quantities of maize grown, the southern part of the plains region is the area where the most cattle, sheep, and pigs are fattened for the markets. Texas alone has about 10 per cent of the cattle, the North-Central States about 50 per cent, and the Western States 16 per cent. The North-Central States have two-thirds of the pigs, Iowa alone having 20 per cent. On the high plains cattle are reared chiefly for their flesh and hides, and are sent to Chicago, St. Louis, Kansas City, Cincinnati, and Omaha for slaughter and export. Sheep are kept mainly for their wool (annual production 300,000,000 lb.); the chief states are Texas, California, Montana, Wyoming, Idaho, Ohio, Colorado, New Mexico, and Utah. Horses and mules are bred for both domestic and export purposes, a special breed of horses being reared in the blue grass region of Kentucky.

Fishing. The great fishing regions are: (1) The North Atlantic Banks from Chesapeake Bay northwards to Newfoundland, yielding cod, herring, mackerel, halibut, haddock, and shad; the headquarters are at Gloucester and Portland. (2) The Pacific Coast and Columbia River fisheries are chiefly the catching and canning of salmon in the Columbia River and on the Alaskan coast. (3) The Great Lakes fisheries yield white fish, sturgeon, and lake trout. Lobster canning is important in New England, and oyster culture along the coast of the middle Atlantic States. Sponge fishing is carried on off the coasts of Florida.

Forestry. The great forest areas are principally in the eastern, the southern, and the Pacific Coast States, where the rainfall is ample. Among the principal forest trees are pines—white, red, and yellow—birch, oak, maple, spruce, Douglas fir, hemlock, beech, hickory, red juniper, walnut, tulip, ash, elm, and linden. The eastern region in New England and on the Northern Appalachian slopes produces maples, beeches, birches, pines, spruces, hemlocks, and larches. Around the Great Lakes the white

pine reaches its highest development. In the middle Appalachian region, hickories, oaks, and chestnuts predominate, although the chestnut is rapidly disappearing on account of the ravages of the chestnut blight. In the Southern States pitch-pines, magnolias, tulip trees, and sweet gums are found. On the Pacific slope the Douglas fir supplies valuable timber, and the "big trees" of California are the greatest vegetable marvels of the country. There are approximately 470,000,000 acres of forest (138,000,000 virgin) in the country, 49 per cent of which lies in the eastern and southern states. The lumber industry ranks fourth. It is said that the annual timber cutting has represented three times the rate of growth, so that afforestation now receives great attention.

Mining. The United States is exceedingly rich in minerals, and its output has been estimated as equal to that of all other countries combined. It produces 70 per cent of the world's petroleum (900,000,000 barrels of 42 gallons annually), more than one-third of the world's coal (annual production, 530,000,000 tons of bituminous coal; 81,000,000 tons of anthracite), 40,000,000 tons of pig iron, and 51,000,000 tons of steel annually. The greatest mineral-producing regions are the Appalachian belt, the Lake Superior region, the Middle Plains States, and the plateau region of the west. Coal, iron, petroleum, copper, lead, zinc, aluminium, gold, and silver are the chief minerals, arranged in order of their value. The coalfields may be grouped into: (1) The Alleghany, by far the most important, covers 65,000 square miles, and stretches from Pennsylvania to Alabama. Anthracite is found in Eastern Pennsylvania, semi-bituminous along the head waters of the Juanita and the Alleghany, with Cumberland as centre, and bituminous on the Alleghany Plateau. (2) The Central Field (48,000 square miles) is chiefly in Indiana, Illinois, and Western Kentucky. (3) The Northern Field is in Michigan. (4) The Western Field consists of detached areas from Iowa to Mexico. (5) The Rocky Mountain and Basin Field includes small areas in California, Arizona, Colorado, Montana, Utah, Wyoming, and Washington. It should be noted that the coal seams are thick, easily worked, and allow the use of modern coal-cutting machinery.

The chief iron-producing States are Michigan, Minnesota, Alabama, Wisconsin, and Pennsylvania; North-east Minnesota and North-west Michigan supply two-thirds of the output. Mesabi and Marquette are important centres and have an advantage in the fact that the ore occurs on the surface, enabling steam shovels to load direct into trucks. Petroleum, used for lighting, power, fuel, and smelting purposes, is produced mainly in Oklahoma, Kansas, Texas, and Louisiana (64 per cent); California (27 per cent); Pennsylvania, Wyoming, and Ohio (6 per cent), and all other states (3 per cent). Natural gas, used in lighting and a few manufactures, occurs in connection with most of the oil fields.

Silver (one-third of the world's supply) is produced largely in Utah, Montana, Idaho, Arizona, Nevada, and Colorado. Gold (one-fifth of the world's supply) is found on the Californian side of the Sierra Nevada, in Colorado about Cripple Creek, in Alaska, and South Dakota, and Arizona. Copper (about half the world's supply) is mined in Arizona,

Utah, and Montana (Butte and Anaconda), and Northern Michigan (Keweenaw Peninsula, pure copper). Lead, associated with silver, is found at Leadville (Colorado), and with zinc in Missouri. Zinc (about a quarter of the world's supply) is found chiefly in Oklahoma and Kansas. Mercury is obtained from New Almaden in California.

Of the total world supply of aluminium between one-third and one-half comes from the central part of Arkansas; of sulphur over half is obtained from the salt dome deposits of Louisiana and Texas; and of phosphates slightly less than half is obtained from Florida, Tennessee, and South Carolina. Building-stones abound in most eastern and western highland States, some of which yield also granites and marbles. Cement and various brick, tile, pottery, and china clays are widely distributed. Tin, however, is almost entirely absent, and large quantities are imported to make tin-plate for the many great canning industries.

Manufactures. The vast stores of coal, oil, and iron, the abundant supplies of raw materials, the ingenuity and organizing capacity of the American people, and the great home demand have made the United States the leading manufacturing country. The chief manufactures in their order of value are the preparation of food products, textiles, iron and steel, machinery, transportation equipment, lumber and paper products, chemicals, petroleum and coal products, non-ferrous metals, printing, leather, rubber, and railroad equipment. Characteristics of the manufactures are mass production, the ruthless scrapping of machinery for more efficient machinery, the labour-saving devices, and the speed and efficiency of the workers.

The immense number of cattle, sheep, and pigs fed in the ranching and maize regions have given rise to an enormous trade in meat. At the great packing centres of Chicago, Cincinnati, Omaha, St. Louis, and Kansas City, cattle and pigs are slaughtered, and the meat is either preserved or sent away in specially designed refrigerator railroad cars. Lumbering is an important industry round all the Great Lakes. Where water-power is available in the forest regions, saw-milling, coopering, and the making of wood-pulp, paper, and furniture are carried on. Detroit, Chicago, and New York are engaged in the furniture trade. Flour-milling is carried on in the wheat districts, where waterfalls supply cheap motive power. Minneapolis, the greatest flour-milling centre in the world, is aided by the Falls of St. Anthony, and Rochester and Superior are other centres.

In iron manufactures the United States easily leads the world, its Steel Corporation controlling more works than any other world combine. The greatest production is in Western Pennsylvania at Pittsburgh, and the surrounding region. Coal (coke the chief smelting agent, is made in great quantities at Connellsville), supplies the fuel, and the ore is brought from the Superior region by lake and rail routes. Gary, Buffalo, Cleveland, Conneaut, and Erie also use the ore of Superior. In the coal-field of Northern Alabama, the iron industry is rapidly developing, as is evidenced by the rise of Birmingham. The limestone of the valleys supplies abundant flux, the iron ore supply is enormous, and labour is slightly cheaper here than elsewhere.

As regards special products, Providence and

Worcester are noted for textile machinery; Buffalo and Erie for milling machinery; Chicago, Buffalo, Detroit, and Worcester for railway plant; Detroit for motor-cars; and Philadelphia for locomotives. Agricultural machinery is chiefly manufactured at Chicago, Buffalo, Cleveland, Erie, Cincinnati, and Louisville, on account of cheap iron and timber, the convenient markets, and the railway and lake facilities. Shipbuilding is an important industry, America being second in shipping tonnage. The chief yards are in Delaware Bay, at Baltimore, Sparrows Point, and Newport News; at Bath (Maine) San Francisco, Superior, and Cleveland; and at the Lake ports, Chicago, Duluth, Detroit, Milwaukee, and Buffalo. Inexhaustible supplies of water power (11,500,000 h.p. developed out of a potential 56,000,000 h.p.) at Niagara, in New England and the Appalachians, and along the Coast Ranges of the Pacific, have given great importance to the electrical industries, and there is a great production of electrical appliances and machinery, particularly at Schenectady and Pittsburgh.

Cotton leads in textile manufactures. It is concentrated in the region east of the Appalachians, in a long belt from Maine to Alabama, with its greatest centres in New England and at the eastern base of the Appalachians in the Carolinas and Georgia, with a lesser centre in Philadelphia. Fall River, New Bedford, Pawtucket, Manchester, Lowell, Lawrence, and Providence are among the chief centres. The cotton products lack the high finish of the British, and find their foreign markets in Latin America and China. Great progress is being made in the woollen industry. Much raw wool is imported, and Philadelphia and Lawrence are the leading centres. Woollen mills are very widely scattered over the industrial north-east, and the New England States have a large output of tweeds, worsteds, and dress materials of excellent quality. Lowell, Providence, New York, and Boston are other leading centres. In silk manufactures America is second only to France. Raw silk from Japan is manufactured in New Jersey (Paterson), Connecticut, Pennsylvania, and New York State. In the artificial silk industry, the United States is the leading producer, the chief regions lying on each side of the Appalachians. Most of the great cities of the east are engaged in the making of ready-made clothes; but New York, Philadelphia, Chicago, Baltimore, Cincinnati, Rochester, and Boston are the chief centres. Leather manufactures are mainly carried on in New England. Lynn and Brockton are noted for their machine-made boots, but the industry is rapidly being decentralized, and St. Louis rivals some of the eastern centres. The chemical industry has shown great development in recent years, especially in the manufacture of dye stuffs, which is centred at Wilmington, Buffalo, Brooklyn, and New York. Many of the great industrial centres are engaged in the manufacture of chemicals, and the exports are in excess of the imports. Rubber manufacturing, particularly automobile tyres, is centred at Akron.

Other manufactures are paper in New York, Massachusetts, and Maine, where poplar and spruce are plentiful; and pottery at Trenton and East Liverpool. Tobacco products are manufactured in Virginia, West Virginia, North Carolina, and Kentucky. Richmond and Louisville are world tobacco

markets. Highly finished and lasting products are not characteristic of American workshops, but serviceable and cheap are terms that may fitly be applied to them.

Commerce. The United States is the first commercial country of the world. Its exports exceed its imports, but imports are steadily increasing. The merchant tonnage is approximately 16,500,000, and the Republic leads in oil-using vessels. One of the greatest war-time achievements of the country was the construction of one of the largest mercantile marines of the world in a period of two years. America, however, lacks the goodwill established in shipping by the British, and the sea-prestige, the evolutionary growth of centuries. The chief ports in the order of importance are: New York, (36 per cent of the import trade, and 23 per cent of the export trade), New Orleans, Philadelphia, Baltimore, Boston, San Francisco, Seattle, and Galveston.

Until the last decade of the nineteenth century the exports were mainly the products of extractive industries—agricultural, mining, and lumbering products; but a notable feature of its exports to-day is that of manufactured goods, especially of iron and steel. More than 45 per cent of the total exports consist of manufactures ready for consumption. These goods comprise equipment for productive purposes, and goods for consumption. Machinery economizing labour is a notable export. The chief exports in order of value, are raw cotton, petroleum products, machinery, automobiles, iron and steel products, wheat and flour, packing-house products, copper, tobacco, cotton manufactures, fruits and nuts, lumber, coal and coke, chemicals, rubber manufactures, and leather. The great bulk of the imports consists of crude materials and semi-manufactured goods required for the great manufacturing industries, and of foodstuffs. More direct trading is now done, and the importance of Europe as an agent in intermediary trade (entrepôt trade) has declined. High-class goods, specialties of the country of export (British textiles, Japanese silk, china ware, and leather goods), find a ready market. The chief imports are: raw silk, coffee, crude rubber, cane sugar, newsprint, hides, petroleum, furs, wood-pulp, copper, tin, fruits and nuts, vegetable oils, wool and mohair, wool manufactures, burlap, fertilizers, art works, cotton manufactures, and oil-seeds. Europe supplies 30.5 per cent of the imports; North America 23.1; South America 13.6; Asia 29.2; Africa 2.3; and Oceania 1.3. The United Kingdom sends 8.2 per cent, and Canada 11.6 per cent of the total imports.

Most of the export trade is carried on with the United Kingdom (16.6 per cent), Canada (16.1 per cent), Germany (8.9 per cent), Japan (5.3 per cent), France (4.8 per cent), Argentina (3.6 per cent), Australia (3.0 per cent), Italy (2.9 per cent), China (2.8 per cent), Cuba and Holland (each 2.7 per cent), Mexico (2.4 per cent), Belgium (2.2 per cent), and Brazil (2.0 per cent).

There is excellent communication between the Atlantic and Gulf ports and those of Western Europe; and no effort has been spared to make the service as rapid as possible. Regular lines of steamers sail from San Francisco and the Puget Sound ports to Japan, China, the Philippines, and Australasia; and a considerable trade is done with

Europe and the Eastern States *via* the Panama Canal.

Trade Centres. There are 94 cities with populations of over 100,000, and no fewer than 185 with 50,000 or more. The chief are: *New York* 6,931,000, the commercial metropolis, and the second city in the world; *Chicago* (3,376,000), the greatest of the Lake ports, and the largest railway centre; *Philadelphia* (1,951,000), the third industrial centre; *Detroit* (1,569,000), the chief centre for the motor-car industry; *Los Angeles* (1,238,000) oil shipping centre, and famed for motion pictures; *Cleveland* (900,000), iron manufacturing and shipping centre; *St. Louis* (822,000), the busiest river port in the world; *Baltimore* (805,000), the metropolis and port of Maryland; *Boston* (781,000), the commercial capital of New England; *Pittsburgh* (670,000), the great centre of the iron and steel trades; *Minneapolis* (464,000), a great primary wheat market and milling centre; *San Francisco* (634,000), the great Pacific port; *Buffalo* (573,000), lake port and important railway centre; *Milwaukee* (578,000), a great grain and milling centre; *Washington* (487,000), the capital of the United States; *New Orleans* (459,000), the largest cotton market and port of the world (after Liverpool); *Cincinnati* (451,000), a great meat packing centre; *Newark* (442,000), a manufacturing city; *Kansas City* (400,000), the centre of the hard winter wheat region; *Seattle* (366,000), the greatest port of the North-west; *Indianapolis* (364,000), a great railway centre; *Rochester* (328,000), home of the camera industry and of optical goods; *Jersey City* (317,000), an important shipping port; *Louisville* (308,000), a tobacco market and *Portland* (Oregon) (302,000), a railroad centre and shipping point.

Alaska (590,884 square miles), including the Aleutian Islands (60,000 population; half are whites, half Indians and Eskimos), purchased from Russia in 1867, occupies the north-western extremity of North America. The essential elements of its relief are the two east and west mountain systems, and the interior plateau between them. In the south is Mount McKinley (20,464 feet), the highest peak in North America. There are more than twenty active volcanoes, and several notable glaciers. Of rivers the chief is the Yukon (1,765 miles; 1,200 navigable for three months). The salmon fisheries of the fiord coast and in the Yukon are important. Almost every considerable inlet has its cannery. Wheat (acclimatized Eastern Siberian type), oats, barley, and rye are grown on the plateau. Gold mining caused the first rush to Alaska, but copper mining now ranks first. The chief copper area is the Kennicott district. Gold is obtained from the auriferous gravels of the

Yukon River (Fairbanks), and from the lode-mining about Juneau, Willow Creek, and Prince William Sound. There are great coal reserves. The two pre-eminent coal-fields are the Katalla (anthracite) and the Matanuska (sub-bituminous to bituminous). Lumbering, fur-hunting, seal fishing, and reindeer herding occupy a large number of whites, Indians, and Eskimos. Abundant water-power (500,000 h.p.) is available for saw mills and pulp mills. Railways run from Seward to Fairbanks, and from the Kennicott mines to Cordova. Trade is chiefly with the United States. The chief exports are copper, gold, salmon, furs, and timber; and the chief imports are foodstuffs, clothing, textiles, machinery, tea, coffee, and sugar. *Juneau* (3,000), the capital, *Nome* (2,200), *Seward* (1,000), and *Fairbanks* (1,100) are the chief trade centres.

Hawaii. The Hawaiian or Sandwich Islands, the cross-roads of the Pacific, lie immediately between the Tropic of Cancer and 20° N. Lat., 2,000 miles from San Francisco. They consist of a chain of eight inhabited (Hawaii, the largest 4,016 square miles) and several uninhabited islands, comprising an area of 6,406 square miles with a population of 370,000. The archipelago is volcanic in origin, and contains Kilauea, the world's greatest active volcano. Everywhere the climate is salubrious. The chief crops are sugar (125,000 acres), taro (native food), pineapples, coffee, tobacco, rice, bananas, bread-fruit, oranges, limes, mangoes, gooseberries, and peaches. Deposits of pumice, sulphur, gypsum, and alum exist. Most trade is with the United States, Australia, and Japan. The chief exports are raw and refined sugar, fruit (especially pineapples), rice, coffee, and hides; and the chief imports are iron and steel goods, mineral oil, bread stuffs and meal, dairy products, lumber, textiles, fertilizers, motors, rubber goods, leather, and paper. *Honolulu* (138,000) is the capital and chief port; and *Hilo* (20,000) is the second city.

Colonial Possessions. The Colonial Possessions were mainly acquired in 1898, as a result of the Spanish-American War. They include the Philippine Islands (114,400 square miles; 12,600,000 population); Guam Island; Wake and the Midway Islands; Samoa; the Virgin Islands (purchased from Denmark); Porto Rico and the Panama Canal Zone.

Mails and Time. Mails are dispatched several times a week from the United Kingdom, but the regular services are those of Wednesday and Saturday. New York is 3,100 miles distant from Liverpool. The time of transit is calculated at about six days.

The times in use are those of New York, Chicago, Denver, and San Francisco, which are 5, 6, 7, and 8 hours respectively behind Greenwich time.

Position, Area, and Population. The Republic of Mexico lies to the south of the United States, stretching across the tapering continent from the Pacific to the Atlantic. It includes most of the land from 32° N. Lat. as far south as 15° N. Lat., and extends beyond the Isthmus of Tehuantepec into Yucatan. Though comprising an area of approximately 768,000 square miles (more than six times that of the British Isles), the population of the country is estimated at less than 19,000,000. The Mexican race is very mixed. Rather more than 40 per cent are of mixed Spanish and Indian blood; rather less than 40 per cent are of pure Indian blood; and only 20 per cent are pure whites. Three forces are at work—the old Indian civilization, the Spanish element, and the commercialism of American magnates—and labour and political troubles impede the progress of the Republic. Spanish is the prevailing language.

Relief. The greater part of the country is a vast horn-shaped tableland (1,500 miles long; 530 miles at its broadest; mean elevation, 6,000 ft.), narrowing and tilted up to the south, and bordered east and west by marginal ranges (the Sierras Madres), which rise with it to the south. The western range is more compact and higher than the eastern one; and both ranges have narrow, triangular coastal plains between them and the sea, the eastern plain being the more extensive. The Great Basin, the northern part of the plateau, is dry and desert, forming an area of inland drainage, where the rivers disappear in salt lakes or marshes. South of the Great Basin lies the plateau of Anahuac, 5,000 ft. to 7,000 ft. in elevation, and for the most part fertile. The rivers generally reach the sea, but none is of great importance, the chief being the Rio Grande del Norte (1,800 miles), which forms part of the northern boundary and is navigable for about 70 miles from its mouth in the Gulf of Mexico. In the central plateau of Anahuac Mexico has one of the most important centres of volcanic activity in the world. One series of volcanoes starts with Popocatepetl (17,520 ft.) and terminates with the isolated volcano of Tuxtla. Another includes the Jorullo, the peak of Tacitiro, and the steaming Colima. The greatest and most beautiful of the Mexican peaks is Orizaba (18,240 ft.). Yucatan is a low karst land, nowhere more than 1,000 ft. high; while the peninsula of Lower California is high. Both the Atlantic (1,500 miles) and the Pacific (2,000 miles) coasts are low, flat, lagoon, and sandspit bordered.

Climate and Vegetation. From north to south the climate passes from hot deserts through a region of summer rains to that of constant rains; the southern narrowing enables oceanic influences to become an important factor; and elevation permits a range of climate from tropical coastlands to cool highlands. The south-east coastal plain has an annual rainfall of more than 80 in., and the eastern slope of the eastern Sierra Madre receives over 50 in. On the plateau the rainfall is less, and the Great Basin is comparatively rainless. Except on the east coast, three zones may be distinguished: the hot lands (*tierras calientes*), including the coastal plains and the land with an elevation under 3,000 ft., with a mean temperature of 85° F.; the temperate lands (*tierras templadas*), including the greater part of the plateau, from 3,000 ft. to 7,000 ft., with a mean temperature of 70° F.; and the cold lands

(*tierras frias*), over 7,000 ft. in elevation, with a mean temperature of 60° F.

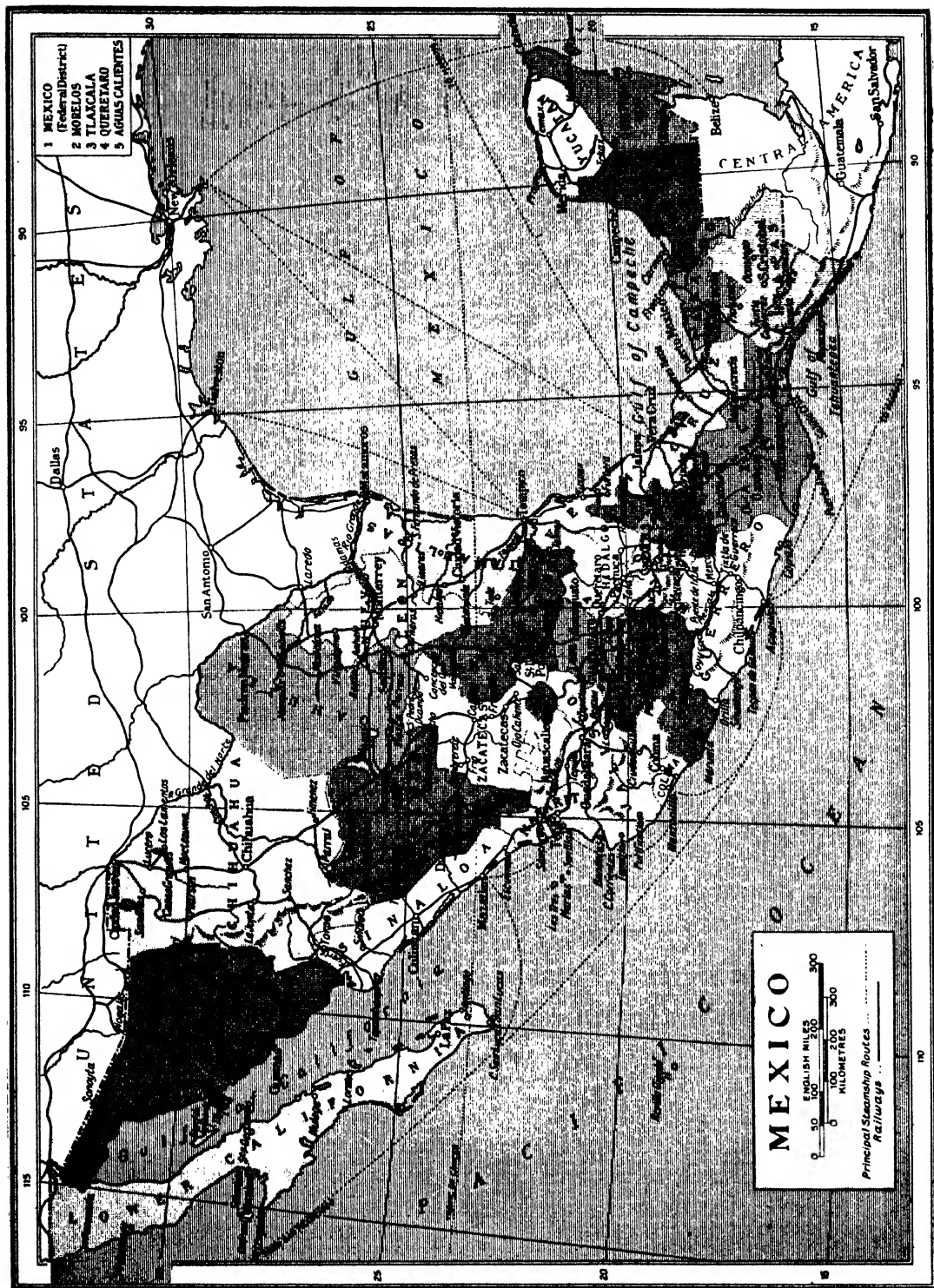
In the north scrubland or thorny thickets (*chaparral*) prevail. To the south the land becomes more fertile, with oases where cereals and fruits are grown. Over the plains stretch vast steppes of scattered wiry bunch grasses; and the countless lava sheets are marked by thickets of thorny cacti, yuccas, and agaves. The Atlantic slopes of the plateau have forests of conifers at the higher levels, mixed coniferous, and broad-leaf forests in the temperate belt, and tropical rain forests at the lower levels. Jungles and savannas divide between them the coastal plain.

Productions and Industries. *Mining.* For centuries mining has been the chief occupation. Mexico is the greatest producer of the world in silver (36 per cent), third or fourth in petroleum, fifth in gold, and first in opals and other precious stones. The greatest silver mines are in San Luis Potosi, Guanajuato, Zacatecas, Chihuahua, Sonora, and Durango. At Real del Oro, in Mexico State, is the greatest Mexican gold mine, and there are important gold mines in Oaxaca. The chief oil-fields are: the Ebano district, about 40 miles west of Tampico; the Panuco district, including the Topila region; the Huasteca district, where are the famous "Casiano," "Cerro Azul," and "Potrero del Llano" wells; the Tuxpan district; and the Tehuantepec-Tabasco district. The oil is conveyed by river, pipe-line, and rail to the ports of Tampico, Tuxpan, Minatitlan, Vera Cruz, Port Lobos, and Progreso.

Agriculture. The agricultural possibilities are great, but development is slow. The chief agricultural products are maize, sugar, henequen, wheat, coffee, beans, tobacco, cotton, fruits, rice, cacao, pepper, maguey, potatoes, tomatoes, vanilla, and coconuts. Coffee, of excellent quality, is grown at altitudes of 1,000 ft. to 3,000 ft. Gum (*chicle*) is produced plentifully in the southern forests. There are large henequen farms in Yucatan's flat lowlands; and the maguey and other cacti yield fibres and intoxicating drinks (*pulque* and *mescal*). Cattle number 2,500,000; goats, 3,000,000; sheep, 1,800,000; pigs, 1,750,000; horses, 400,000; mules, 360,000; and asses, 290,000.

Manufactures. Industry is slowly developing. Pottery and tile-making are important at Puebla, Cholula, Guadalajara, and Guanajuato; and there are oil refineries at Tampico, Port Lobos, Vera Cruz, and Minatitlan.

Communications and Commerce. Internal transport of goods is effected cheaply by rail, but asses and pack trains on poor roads are more commonly used. There are 16,000 miles of railway. The chief railways are the Mexican (520 miles), the Tehuantepec (184 miles), the Mexico North-Western (512 miles), the Southern Pacific (1,000 miles), the United Railways of Yucatan (500 miles), and the Constitutional Railways of Mexico. From Mexico City railways run north to the railways of the United States, on the eastern side through San Luis Potosi and Monterey, in the centre through Leon and Chihuahua, and through Mazatlan and Guaymas on the western sides. Westwards from the capital lines pass through Colima to Manzanillo, southwards through Puebla to Oaxaca, eastwards to Vera Cruz, and south-east to the Tehuantepec line running from Puerto Mexico to Salina Cruz.



Most of the trade is with the United States, Great Britain, France, Germany, Spain, and the South American republics. The chief exports are silver, gold, petroleum, copper, lead, zinc, iron, coffee, henequen, dye-woods, sugar, drugs, vanilla, fruits, tobacco, timber, hides, skins, and dyestuffs; and the chief imports are cotton goods, chemicals, mining and agricultural machinery, steam engines, railway materials, and coal.

Trade Centres. The chief towns are: *Mexico City* (906,000), the capital and chief commercial and manufacturing centre; *Guadalajara* (143,000), a

mining, manufacturing, and agricultural centre; *Puebla* (96,000), a mining centre; *San Luis Potosi* (57,000), a mining and railway centre; *Leon* (54,000), a commercial centre; *Vera Cruz* (50,000), the chief port for general trade; *Mérida* (63,000), the capital of Yucatan; *Monterey* (76,000), the chief industrial centre of the north; *Aguascalientes* (45,000), an industrial centre; *Tampico*, the principal oil port; *Salina Cruz*, Pacific port; and *Progreso*, the chief port of Yucatan. Mails are dispatched from Great Britain to Mexico every Wednesday and Saturday.

The time of transit is about 12 days.

Position, Area, and Population. Central America, the home of the first native civilization of the New World, but the Cinderella of to-day, lies in a north-west to south-east direction, between 18° and 8° N., and extends from the Isthmus of Tehuantepec (130 miles wide) to the Isthmus of Panama (50 miles wide), thus occupying an exceedingly important commercial position between the Atlantic and Pacific Oceans. Although it is an isthmus joining North and South America, its connection with these continents was made in recent geological times. In breadth it varies from 30 miles to 300 miles, and in length it is about 1,200 miles. Its area is about 275,000 square miles, and this supports a population of more than 5,000,000, comprising Spaniards, Indians, and half-breeds. Politically, it consists of British Honduras, and the six small republics of Costa Rica, Guatemala, Honduras, Nicaragua, San Salvador, and Panama.

Relief, Climate, and Vegetation. Physically, Central America is a relic of the ancient continent of Antillia, and is on the whole a mountainous region. Its mountains run in a general west-to-east direction, and are highest near the west coast. South of the Guatemala isthmus and along the Pacific coast they are covered with young volcanic deposits, above which over thirty lofty active volcanoes rise. The chief lowlands are the Yucatan Peninsula, a flat karst land, and the alluvial plains bordering the Atlantic coast. On the west the volcanic range rises steeply from the narrow coastal plain.

The great diversity of elevation causes corresponding differences in temperature, but the climate is everywhere equable. The lowlands are hot (the Atlantic coast has a temperature of 92° F. all the year round), the uplands cool. Except in Yucatan, the rainfall is everywhere abundant, being always more than 60 in.; it falls chiefly in late summer when the belt of convectional rains has swung northwards, but on the windward slopes of the highlands moisture is condensed from the North-East Trades in winter also.

Dense, wet jungles cover the coastal plains and lower mountain slopes, attaining a ranker luxuriance and a higher altitude on the moister Atlantic than on the drier Pacific slope. Rich savannas occur on the uplands, temperate forests on the higher mountain ridges, and deadly mangrove swamps along the east coast.

Economic Conditions. Agriculture is the leading industry. From the plantations of cacao, sugar, and coffee, most of the wealth is derived. Other agricultural products are tobacco, cassava, maize, fruits (bananas, pineapples, zapote, mamey, orange, lime, mango), and cotton. Imported cattle and sheep thrive on the savannas, and supply the home market (hides are exported). The vast forest wealth in hardwoods, dyewoods, medicinal plants, rubber, oil plants, balsams, gums and resins, is hardly exploited. Ores of gold, silver, and lead are worked on a small scale only, awaiting transport development. There are home industries of cloth from cotton and agave fibres, pottery, and basket-making. The foreign trade is small. Largely a self-contained and self-sufficing area, Central America is not likely to show great progress till its abundant resources are exploited by more progressive races.

Costa Rica (23,000 square miles; 516,000 popula-

tion), the most advanced republic, has a very favourable position for commerce, heightened by the opening of the Panama waterway. Its mountains are not a continuous cordillera, but are divided into two groups, north-west and south-east. Between the northern volcanic section, the Gatusos Range, and the more regular southern Talamancan Range, is a depression about 20 miles broad, and a little less than 5,000 ft. at the water parting. Coastal plains occur, narrower and higher on the Pacific than on the Atlantic side. Diversity of elevation causes corresponding differences in temperature—from hot tropical lowlands to cool uplands—but the climate is everywhere equable and temperate, except on the Atlantic shore.

Agriculture is the principal industry, and coffee and bananas are the chief agricultural products. Under American and British supervision the deep, rich, alluvial, vegetable or volcanic soil yields coffee of the highest quality (usually at a height of 2,500 ft. to 4,500 ft.) and enormous crops of bananas. Other cultivated products are sugar, beans, cacao, maize, rice, tobacco, potatoes, pineapples, zapote, orange, lime, mango, and cassava. Stock-rearing on the savannas is increasing, and is capable of great expansion. Mineral wealth—gold, silver, copper, and salt—is believed to be great, but remains practically unexploited. Exploitation of the forests has commenced, and hardwoods are among the exports.

Nearly all the heavy transport is done by ox wagons on the poor roads. There are some 500 miles of single-track railway of metre gauge, largely under American control. The main systems are the Northern, Port Limon to San José (103 miles), and the Pacific Railway, Punta Arenas to San José (69 miles). Most of the trade is with the United States, the United Kingdom, Germany, and Latin America. The chief exports are coffee, bananas, sugar, gold, silver, cacao, hardwoods, fruits, vegetables, fustic, hides, and rubber; and the chief imports are cotton textiles, jute sacks, hardware, chemicals, paper, foodstuffs, liquors, railway materials, machinery, paints, and cattle.

San José de Costa Rica (42,000), the mountain-cradled capital; *Punta Arenas* (6,000), the chief Pacific port; and *Limon* (12,000), the chief port, are the chief towns.

Guatemala (42,353 square miles; 2,100,000 population) is the most mountainous of the republics. Running north-west to south-east is a high range of mountains, containing several volcanic summits rising to nearly 13,000 ft., which have on occasions proved destructive. Fringing the range on the Pacific side is a low, narrow, well-watered, and fertile coastal plain. Most of the surface of the country is covered with volcanic ash layers, varying from a few inches to 150 ft. in thickness. In the lowlands the climate is hot and damp, and malaria is a plague. The higher lands are temperate and healthy, and here are found the chief towns. Agriculture and forestry are the principal occupations. The chief crops are coffee (of excellent quality), bananas (on the Atlantic slope), sugar, rice, cotton, maize, potatoes, and wheat. Horses, cattle (320,000), sheep, and goats are important on the plateau. There are 1,300,000 acres of forest, and chicle, rubber, mahogany, and dyewoods are important exports. The mineral wealth, with the exception of

silver-lead, is not exploited, although gold, copper, iron, and chrome are found.

Few of the roads can be used, even by ox-carts, and there are only about 400 miles of railway, including through communication between the Atlantic and Pacific coasts. All the railways are of narrow gauge, and the main railway (195 miles; Puerto Barrios-Guatemala la Nueva-San José) is the property of an American corporation. Much German and American capital has been expended in Guatemala, and the chief foreign trade is with the United States, Germany, the United Kingdom, and Holland. Coffee, bananas, chicle, timber, silver, hides, sugar, honey, and beans are the chief exports; and cotton goods, flour, corn, linen, hemp, jute, paper, coal, leather goods, woollens, hardware, toys, machinery, and railway material are the chief imports. *Guatemala la Nueva* (121,000), the capital; and *Puerto Barrios*, the chief port, are the principal towns.

Honduras (44,275 square miles; 860,000 population) is seamed in all directions with intricate sierras. Its climate is everywhere equable, but the great diversity of elevation causes corresponding differences in temperature. Only a small percentage of the land is cultivated. The chief crops are bananas, fruits (lemons, oranges, and pineapples), sugar, rice, tobacco, coffee, indigo, maize, vegetables, henequen, coconuts, and wheat. Bananas and coconuts are grown in large quantities on the Atlantic coast under American supervision. About 500,000 cattle graze on the savannas, but Honduras is capable of rivalling Uruguay if its labour became less erratic. The forests yield mahogany, rubber, sarsaparilla, cedar, fustic, kapok, dyewoods, and yucca. Most trade is with the United States, the United Kingdom, and Germany. The chief exports are bananas, ores, bar-silver, cattle, hides, coconuts, mahogany, cedar, rubber, fruits, coffee, sugar, and tobacco; and the chief imports are cotton textiles, jute sacks, hardware, chemicals, paper, foodstuffs, and liquors. *Tegucigalpa* (40,000), the capital; and *Amapala*, a port, are the chief towns.

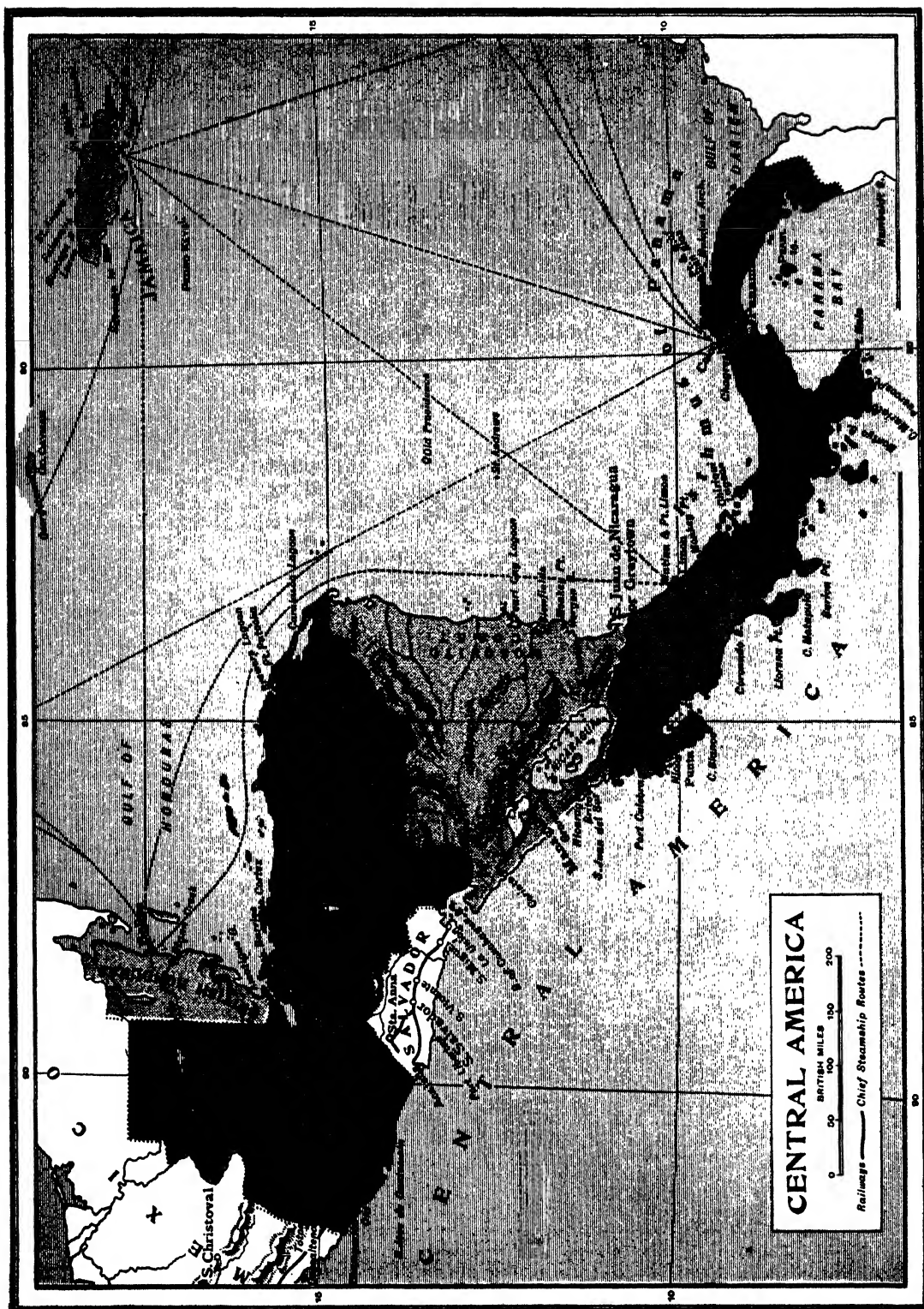
British Honduras (8,598 square miles; 51,000 population, few of whom are Europeans), a British Crown Colony, lies between Yucatan and Guatemala. Innumerable islands fringe its flat lagoon coast, and from the narrow, low, swampy, and unhealthy coast lands, hills from 500 ft. to 4,000 ft. succeed each other to the western boundary. The climate is hot (75° F. to 80° F.) and damp, healthy on the uplands, and malarial on the coastal lowlands. Most of the country is virgin forest, with resources in land, timber, and water-power lying idle or unharnessed. Most of the trade is with the United Kingdom and the United States. The chief exports are bananas, chicle, coconuts, mahogany, logwood, plantains, and tortoiseshell; and the chief imports are foodstuffs, cotton textiles, hardware, machinery, oils, spirits, tobacco, and soap. *Belize* (13,000), the capital; and *Stann Creek*, a small exporting centre, are the chief towns.

Nicaragua (51,660 square miles; 750,000 population), the largest republic, a land of disastrous earthquakes and eruptions and of stormy political history, lies south of Honduras and north of Costa Rica, and is bordered by the Atlantic and Pacific Oceans. For the most part its people are easy-going and ignorant, practising primitive agriculture, and enjoying a

moderately idle existence, varied with political revolutions. Its eastern lagoon coast borders a low, swampy plain, across which flow the Segovia, the Rio Grande, the Bluefields, and the San Juan, from the longitudinal valleys between the mountains which strike west and east. The country is seamed with mountain ranges, rising in places to 7,000 ft. In the west is a volcanic region with a depression between two lines of higher ground. In this depression lie Fonseca Bay, Lake Managua, and Lake Nicaragua (nearly 3,000 square miles), drained to the Atlantic by the San Juan River. Three climatic zones may be distinguished: the hot alluvial plains region up to a height of 2,000 ft.; the higher temperate region, 2,000 ft. to 6,000 ft.; and the still higher and colder region, 6,000 ft. and upwards. The annual rainfall in the west is about 60 in.; in the east over 100 in. along much of the coast; and over 200 in. round the mouth of the San Juan River.

Most of the people live by agriculture, and this industry would develop greatly were it not for the scarcity of labour. Coffee is the chief product. Other products include rice, tobacco, bananas, cacao, beans, sugar-cane, and maize. The forests, worked both from the Atlantic and the Pacific, yield cedar, mahogany, rosewood, gums, rubber, and medicinal plants. There are excellent grass pastures near the Costa Rican border, and the republic supports over a million cattle. American and British companies mine for gold and silver in the north, and copper, coal, oil, and precious stones are found. Good roads are few. The Pacific Railroad (146 miles) runs from Corinto to Leon, Managua, Granada, and Diriamba. Most trade is with the United States, the United Kingdom, Germany, France, Spain, and Holland. The chief exports are coffee, bananas, coconuts, cocoa, timber, hides, skins, rubber, drugs, gold, and silver; and the chief imports are iron goods, breadstuffs, cottons, and chemicals. *Managua* (48,000), the capital, recently partially destroyed; *Leon* (50,000), the old capital; *Corinto* and *San Juan del Sur*, Pacific ports; *San Juan del Norte* and *Bluefields*, Atlantic ports; and *Granada* and *Matagalpa*, inland agricultural centres, are the chief towns.

Panama (32,380 square miles; 467,000 population) forms the connecting isthmus in the shape of a double curve, between South and Central America. Formerly one of the nine Departments of Colombia, it revolted in November, 1903, and established a separate government. The mountains of Costa Rica enter Panama as the Culebra range, and end in a low gap not more than 300 ft. high (utilized by railway and canal), beyond which rise the San Blas and other south and east trending ranges. Generally speaking, the climate is tropical, humid, and unhealthy (except in the Canal Zone). More than half the country is unoccupied, and the rich natural resources of the fecund soil are hardly exploited. The natives draw little profit from the Panama waterway. Life is easy, and so there is a disinclination to work. Bananas, coconuts, and sugar-cane are the chief agricultural products, the majority of the banana plantations being along the Atlantic coast (American controlled); while the best coconuts are grown on the coral islands and coast of the Gulf of San Blas. Other products of agriculture and the forests are mahogany, melons, pumpkins, oranges, coffee, cacao, rubber, hides, copaiba, sarsaparilla,



ipeacuanha, and tobacco. On the eastern and Pacific slopes, cattle-rearing is carried on successfully, and turtles and pearl-fishing in the Gulf of Panama and at Coiba Island are important.

Goods are conveyed in two-wheeled ox-carts on the imperfect roads. The total railway mileage is about 300, the most important line being the old inter-oceanic railway completed in 1855 (American owned and operated), which connects Panama and Colón (47 miles). Most trade is with the United States. The chief exports are bananas, hides, rubber, turtle-shells, sugar, coconuts, pearls, cabinet woods, coffee, and cacao; and the chief imports are cotton goods and foodstuffs. *Panama* (83,000), the capital and chief Pacific port; *Colón* (34,000), the Atlantic terminus of the Panama Canal; *Balboa* and *Cristobal*, are the chief towns.

Salvador or El Salvador (13,176 square miles; 1,438,000 population), the most thickly populated, the most intensely developed, and the smallest of the republics, lies on the Pacific coast. It includes most of the Pacific volcanic area between 87½° and 90° W. Long., and is subject to periodic earthquakes and destructive eruptions. Save for the low, alluvial, unhealthy plain, bordering the 170 miles of Pacific coast, the country is mountainous and abounds in volcanoes. The climate varies with the altitude, the coastal belt being unhealthy, the lofty interior more bracing. Agriculture and mining are

the chief occupations. The rich volcanic soil yields coffee (the chief crop), balsam (in the Balsimos region), sugar-cane, tobacco, maize, henequen, indigo, rubber, cacao, and rice. Gold and silver mining operations are carried on by Salvadorian, United States, and British companies; and iron, copper, and mercury are found. The pastoral areas provide meat for the whole country, and hides for export.

The railway mileage is 270. A British company, the Salvador Railway Company, owns and operates the San Salvador-Santa Ana-Acajutla line (100 miles); the remaining railway interests are American. Most trade is with the United States, the United Kingdom, Germany, and France. The chief exports are coffee (80 per cent), sugar, balsam, hides, rubber, indigo, tobacco, skins, henequen, gold, and silver; and the chief imports are cotton textiles, flour, iron and steel goods, lard, motor-cars, minerals, jute sacks, chemicals, paper, liquors, proprietary, foodstuffs, silk goods, and machinery. *San Salvador* (90,000), the capital; *Santa Ana*, a commercial centre; and *Acajutla*, *La Libertad*, and *La Union*, ports, are the chief towns.

Time of Transit. There is regular communication between the various parts of Central America and the United States and the countries of Europe. The time of transit from Great Britain is roughly between 17 and 25 days.

Description. The West Indies, island remnants of the ancient continent of Antillia, form an arc-like archipelago stretching from Trinidad to Cuba. They vary in size from Cuba, many hundred of miles in length, to tiny islets of only a few square miles, and occupy a total area of nearly 100,000 square miles with a population of approximately 6,600,000.

Climate and Vegetation. Except in some of the Bahamas, the climate is tropical and the temperature is equable, averaging a little over 70° F. in winter and over 80° F. in summer at sea-level. Lying in the north-east trade wind area, they receive rain at all seasons, and especially on the windward slopes. Relatively wet and dry seasons, however, occur. In the north the rainy season is from May to October; in the south it is from June to December. February and March are usually the driest months. Devastating hurricanes are frequently experienced between August and October. Malaria is prevalent in the damp lowlands, but elsewhere the climate is generally healthy. Tropical forests are found in the lowlands, passing to savannas in the drier regions, or even to semi-deserts covered with cacti and aromatic shrubs.

The British West Indies (12,450 square miles; 1,900,000 population) include the Bahamas, Barbados, Jamaica, Trinidad, and part of the Leeward Islands, and the Windward Islands.

The Bahamas (4,404 square miles; 62,000 population, mostly descendants of liberated Africans), a British Crown Colony, are a chain of over 3,000 coralline islands and rocks, rising from the Great Bahama Bank to the east of the Florida Channel. Only twenty-nine of the islands are inhabited. Unlike most of the West Indies, the Bahamas are very flat, the highest point being only about 200 ft. above sea-level. The climate is charming and equable. Sponges, pineapples, bananas, oranges, lemons, figs, olives, tomatoes, coconuts, and vegetables are exported; and foodstuffs, wines, spirits, hardware, and cotton, silk, and woollen fabrics are imported. *Nassau* (13,000) is the capital.

Barbados (166 square miles; 172,000 population) is the most easterly of the West Indian islands. Its principal exports are sugar, molasses, rum, and cotton; and its imports are rice, salted meat, salted fish, corn, butter, flour, and Indian-corn meal. *Bridgetown* (14,000) is the capital.

Jamaica (4,431 square miles; 1,022,000 population), the largest and most valuable British possession in the West Indies, lies in the heart of the American Mediterranean, and is of surpassing beauty. Above a very narrow plain, the higher land rises in steep, chalk cliffs. The west is a limestone tableland, forming a true karst landscape. Separated from this limestone plateau by a valley are the Blue Mountains which extend eastwards. Agriculture occupies the bulk of the population. All tropical products grow to perfection. The chief exports are coconuts, logwood and logwood extract, sugar, coffee, rum, cocoa, bananas, pimento (almost all the world's supply), copra, ginger, oranges, and cigars; and the chief imports are cotton goods, boots and shoes, fish, rice, flour, hardware, condensed milk, gasoline, motor-cars, timber, and cigarettes. *Kingston* (63,000), the capital and chief port; *Spanish Town* (9,000), the old capital; and *Port Antonio* (6,000), the chief fruit-exporting centre, are the chief towns. The dependencies of Jamaica are the Turks, Caicos, and Cayman Islands.

Trinidad (1,862 square miles; 413,000 population) and **Tobago** (114 square miles; 24,000 population) have formed a single British Crown Colony, since January, 1899. The chief exports are sugar, Angostura bitters, cocoa, asphalt (from the Pitch Lake of La Brea), petroleum, coconuts, copra, bananas, oranges, cabinet woods, rum, and molasses; and the chief imports are cotton goods, flour, machinery, hardware, metal manufactures, boots and shoes, fish, vehicles, and motor-cars. *Port of Spain* (70,000) is the capital of Trinidad, and *Scarborough* (1,500) is the capital of Tobago.

The British Leeward Islands are Antigua with Barbuda and Redonda (108 square miles; 32,000 population; St. John, the capital), producing sugar, cotton, limes, tamarinds, coconuts, pineapples, pepper, tobacco, onions, and phosphates; St. Kitts, Nevis, and Anguilla (150 square miles; 43,000 population; Basse Terre, the capital), producing sugar and cotton; Dominica (291 square miles; 40,000 population; Roseau, the capital), producing cocoa, coffee, vanilla, copra, lime-juice; Montserrat (32½ square miles; 12,000 population; Plymouth, the capital), producing cotton, lime-juice, and sugar; and the Virgin Islands (58 square miles; 6,000 population), producing sugar, cotton, tobacco, limes, and coconuts.

The British Windward Islands (516 square miles; 177,000 population) include Granada (133 square miles; 68,000 population; St. George's, the capital), producing cocoa, nutmegs, sugar, tobacco, rubber, coffee, cotton, kola nuts, and tropical fruits; St. Vincent (150 square miles; 46,000 population; Kingstown, the capital), producing sugar, rum, molasses, cotton, cocoa, spices, arrowroot, ground nuts, timber, and tropical fruits; St. Lucia (233 square miles; 55,000 population; Castries, the capital), producing sugar, logwood, cocoa, kola nuts, coconuts, tropical fruits, vanilla, cotton, limes, and rubber; and the Grenadines (8,462 acres; 8,000 population).

Cuba (44,164 square miles; 3,638,000 population), "the Pearl of the Antilles," the largest island of the West Indies, lies on rather than in the Caribbean Sea. In 1901 it became an independent republic, but its people proving unworthy of full trust, it is now, in reality, a quasi-protectorate of the United States. Everywhere the land rises steeply out of the sea, forming cliffs, which in the east rise in successive terraces. Mountain ranges, part of the Antillean chain, run lengthwise through Cuba, forming its spine. These ranges are high in the east, where the Sierra Maestra rises in the Peak of Torquina to nearly 8,400 ft.; and comparatively low in the west, where the Organos range nowhere attains much above 2,500 ft. Between these sierras is a limestone karst region—a rolling, undulating country, broken by hills.

Cuba derives its wealth from its fertile, cultivated areas, which produce sugar and tobacco (chiefly), coffee, cocoa, rice, maize, cotton, and rubber. Sugar is the staple crop, the total area of the sugar plantations being about 1,500,000 acres. Over 5,000,000 tons of cane sugar are annually produced (a quarter of the world's supply). Probably the sugar-cane flourishes better between the Organos and Maestra ranges than in any other region of the world. Next to sugar comes tobacco, the manufacture of which has an annual value of £10,000,000. About

three-fourths of the tobacco comes from the province of Pinar del Rio, the remainder from Havana and Santa Clara provinces. The southern slopes of the Organos range, the famous Vuelta Abajo, produce on small farms the finest cigar tobacco in the world. Other agricultural products are coffee, rice, brandy, honey, sweet potatoes, yams, spices, alcohol, and henequen. The export of fruits—pineapples, bananas, coconuts, oranges, and lemons—promises to become more valuable even than tobacco. There are about 4,000,000 cattle, 700,000 horses, and 64,000 mules. Lack of transport facilities hinders the exploitation of the forest products, which include mahogany, cedar, dyewoods, fibres, gums, resins, and oils. The mineral wealth consists of copper, iron, silver, manganese, asphalt, and petroleum. Apart from sugar, tobacco, and alcohol, the manufactures are of little importance.

Among the chief railways (6,000 miles), which connect the principal towns and ports from Pinar del Rio to Santiago de Cuba, are the United, the Cuban, the Cuban Central, and the Western Railway. Most of the foreign trade is with the United States, which has the advantages of tariff discrimination, invested capital, and geographical position, followed by the United Kingdom, France, Spain, and Germany. The chief exports are sugar, tobacco, fruit, rum, timber, minerals, hides, resins, oils, and fibres; and the chief imports are foodstuffs, textiles, machinery, metals and metal goods, chemicals, leather and leather goods, perfumes, cosmetics, toilet soaps, china, and earthenware.

The chief towns are *Havana* (589,000), the capital; *Santiago de Cuba* (80,000), the former capital; *Matanzas* (64,000), the second seaport; *Cienfuegos* (74,000), *Manzanillo* (64,000), *Guantánamo* (53,000), and *Trinidad* (46,000), seaports; and *Camagüey* (93,000), *Sancti Spiritus* (88,000), and *Pinar del Rio* (50,000) inland centres.

Porto Rico (3,435 square miles; 1,544,000 population), ceded by Spain to the United States in 1898, is situated about 80 miles east of Haiti. Its surface is very diversified, the central portion being rugged and mountainous and attaining an elevation of 3,600 ft. The soil is fertile and the timber trees are very valuable—especially sandalwood, rosewood, mahogany, and ebony. Three-fifths of the population are engaged in agriculture, and a quarter of the whole land is under cultivation. Coffee, sugar, fruit, tobacco, maize, sweet potatoes, rice, vegetables, and cotton are cultivated. Most trade is with the United States. *San Juan Bautista de Porto Rico* (72,000), the capital; and *Ponce* (42,000), a port, are the chief towns.

Haiti, the second largest of the West Indian Islands, lies between Cuba and Porto Rico. Politically, it is divided between the French-speaking, black Republic of Haiti in the west and the much larger, less densely peopled, Spanish-speaking, mulatto Republic of Santo Domingo in the east. In outline, this mountainous island, equal in area to Scotland, resembles a swimming frog. The climate is tropical, but the heat is tempered by the trade winds.

The Republic of Haiti (10,204 square miles; 2,300,000 population) occupies the more mountainous and rugged western third of the island. American officials control its finance, customs, public works, police, and sanitary service. Coffee

(of excellent quality) is the chief source of wealth. Of much less importance are cotton, sugar, logwood, cocoa, tobacco, mahogany, cedar, satinwood, rosewood, honey, gums, oil-seeds, maize, fruits, and indigo. Most trade is carried on with the United States (the bulk), the United Kingdom, France, Germany, and Belgium. The chief exports are coffee (75 per cent), cotton, logwood, cotton seed and oil, lignum vitae, timber, coffee, sugar, and cocoa; and the chief imports are cotton goods, wheat flour, lard and substitutes, soap, iron and steel goods, fish, sacks, cordage, machinery, tobacco, and kerosene. *Port au Prince* (125,000) is the capital and chief port.

The Republic of Santo Domingo (19,300 square miles; 1,200,000 population) occupies the eastern two-thirds of the island, and is under American supervision. Sanguinary revolutions, seismic disturbances, and the indolence of its people have contributed to its backward condition. Yet its beauty, majesty, and fruitfulness await only the assistance of law and ordered government for progressive development, and foreign money, mainly American, is now being attracted. Agriculture is the chief source of wealth, sugar-cane and cacao being the chief crops. Tobacco, cotton, coffee, bananas, and hides are also important. From the forests cedar, mahogany, logwood, satinwood, wax, and dividivi are obtained. Minerals are abundant, but practically unworked. There are few good roads, and railways are in their infancy. The bulk of the trade is with the United States, Great Britain, and Canada. The chief exports are sugar, cacao, tobacco, coffee, and forest products; and the chief imports are iron and steel goods, cottons, tinned foods, meat, and flour. *Santo Domingo* (40,000) is the capital and chief port.

The Virgin Islands (132 square miles; 27,000 population). The United States purchased the three islands of St. Thomas, St. John, and St. Croix (Santa Cruz) from Denmark. All are volcanic in formation, and are valuable as coaling stations. St. Thomas is the headquarters of the bay-rum industry. *St. Thomas* (8,000), the capital, contains one of the finest harbours in the West Indies, and has a large coaling and oil refuelling station. Other centres are *Christiansted* (5,000), and *Frederiksted* on St. Croix.

French West Indies. The French Caribbees include *Martinique* (385 square miles; 245,000 population) and the Guadeloupe Group (Basse Terre, Grand Terre, Marie Galante, Les Saintes, Désirade, St. Barthélemy, and nearly half of St. Martin; 688 square miles; 230,000 population). Martinique is a lovely, rugged, volcanic island, containing the terrible Mont Pelée, which totally destroyed the town of St. Pierre in 1902. Sugar, cacao, rum, coffee, tobacco, vegetables, pineapples, cotton, and bananas are the chief economic products. *Fort-de-France* (27,000), the capital, is the chief French naval station in the West Indies.

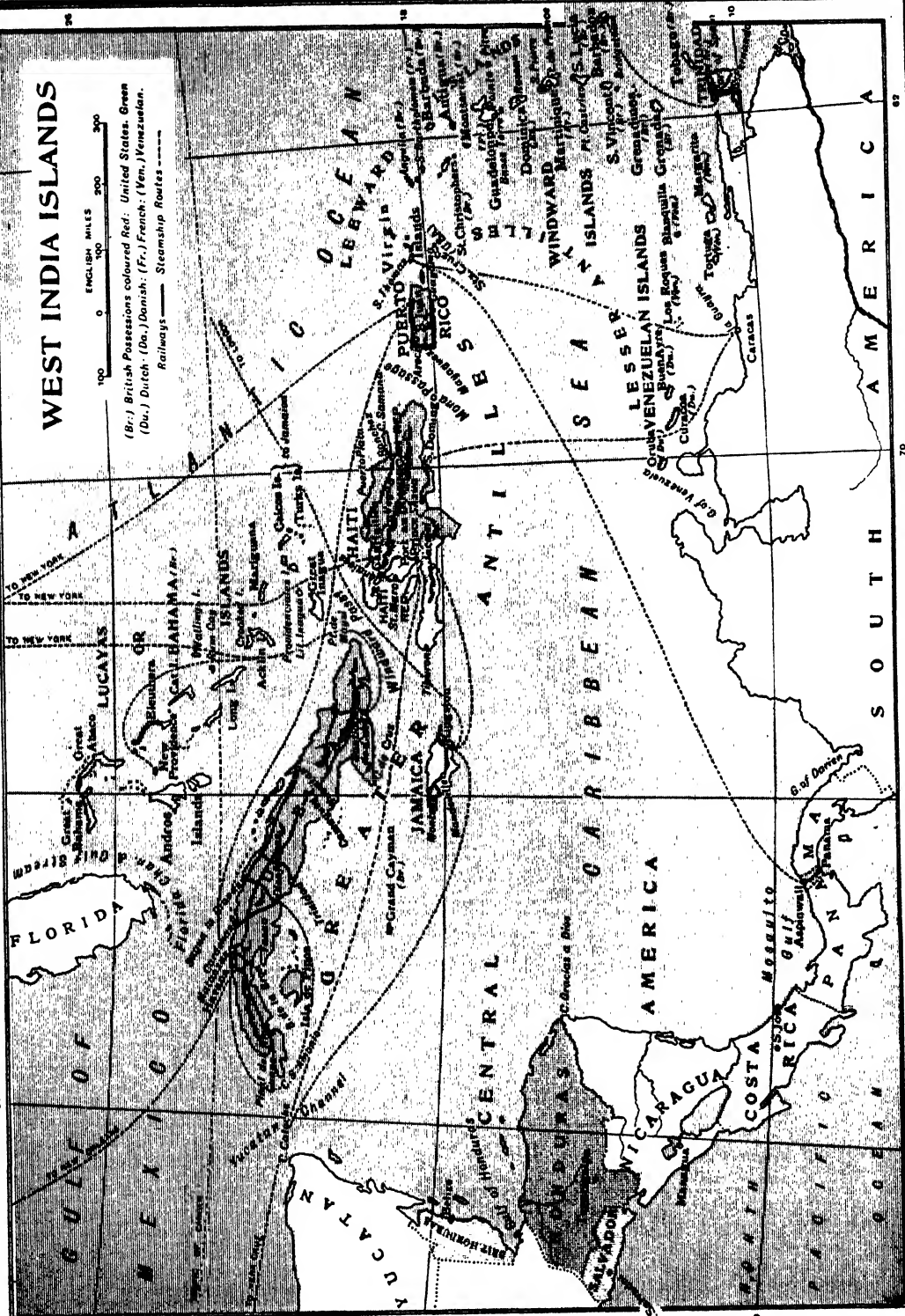
The Dutch West Indies consist of two groups of islands about 500 miles apart. Curaçao (210 square miles; 44,000 population) is a flat, volcanic island with a low rainfall. It produces, sugar, maize, beans, tobacco, aloes, salt, cattle, and leached guano. The island is best known from its liqueur, distilled from a particular kind of orange. *Willenstad* (16,000) is its capital. Bonaire (95 square

WEST INDIA ISLANDS

ENGLISH MILES
100 0 100 200 300

(Br.) British Possessions coloured Red: United States. Green
(Du.) Dutch: (Da.) Danish: (Fr.) French: (Ven.) Venezuelan.

Railways — Steamship Routes - - - - -



miles; 7,500 population), and Aruba (69 square miles; 9,000 population) are of little importance, though the latter has large deposits of leached guano. St. Martin (the larger, southern half; 17 square miles; 2,300 population) has salt for its staple. Philipsburg is its capital. St. Eustache (7 square miles; 1,100 population) exports yams

and sweet potatoes. Orangetown is its capital. Saba (5 square miles; 1,600 population) is an extinct volcano. Bottom is its chief town.

Time of Transit. There is good communication with the United States and Europe. The time of transit from Great Britain to the more important places varies from 14 to 21 days.

Position, Area, and Population. South America, the least explored or exploited of all continents, lies to the south-east of North America, between 12° N. and 56° S. Lat., and between 35° and 81° W. Long. Joined to Central America by the Isthmus of Panama (about 50 miles wide), it is almost surrounded by the ocean, having the Pacific on the west, and the Atlantic on the north and east. The continent is pear-shaped in outline, tapering from north to south, and has its bulk north of the Tropic of Capricorn. Its extreme length, from Punta Gallinas to Cape Horn, is 4,700 miles; and its greatest breadth, from Punta Parina to Cape Branco is 3,250 miles. With the exception of Africa, it is the most compact of the continents, having no notable peninsulas, while its islands form less than 1 per cent of the whole area of 7,000,000 square miles. The basis of its population of over 60,000,000 is the mestizo, or mixed race of Spanish and Indian blood. Spanish is the predominant language, except in Brazil, where Portuguese is the chief tongue. Immigrants from the Mediterranean lands of Europe have established themselves in the southern republics, and other elements of the population are negroes and native Indians. Black, white, and yellow blood are mingled in many South American peoples.

Coast Line. The coast line, some 17,300 miles, is only three-quarters that of Europe, whose area is little more than half as great. This represents less than twice the minimum possible perimeter, and only Africa has a smaller proportion. Fortunately, the wealth of the rivers of South America allows the interior to be easily approached.

Relief. Like North America, the continent of South America consists of three distinct natural regions—the Western Cordilleran region, the Central Plain, and the Eastern Highlands. The vast young folded mountain system of the Andes or South American Cordillera, the least broken of all mountain systems, is the outstanding orographical feature of the continent. It extends the whole length of the continent from Panama to Staten Island, a distance of 4,500 miles, paralleling the Pacific Coast, and varying in width from 5 to 500 miles. From Cape Horn the Andes run for about 2,000 miles in a comparatively simple, single line, up to the great westward curve of the coast; from this point they become a double chain, enclosing the Bolivian plateau; and northward they become a treble chain. Aconcagua, the highest peak, on the Chile-Argentine line, towers to a height of over 23,000 ft., but more striking are the slightly lower peaks of Illimani, Cotopaxi, and Chimborazo. Lofty as are the Andes, their base lies 10,000 ft. below the level of the Pacific, and their unstable tectonic conditions are translated into the constant earthquakes which devastate the region. The Eastern Highlands are subdivided into the Guiana Highlands in the north and the Brazilian Highlands in the east. They are fragments of an old continent, and are composed essentially of flat-lying rocks, which have been worn down greatly by atmospheric agencies. The Central Plain, lying between the Eastern and Western Highlands, stretches from the north to the south of the continent, and is the uplifted bed of an ancient "Mediterranean" Sea. The mighty Amazon (the world's largest river, and in reality "an inland sea rather than a river"), the Orinoco, and the Paraná-

Paraguay (Plate) drain the fertile lowlands, and are connected at their sources, the Orinoco with the Amazon, and the Amazon with the Paraná. At certain seasons of the year the lowland country becomes inundated to such an extent that it presents, in miniature, a picture of the once primeval inland sea. Fortunately, the rivers are navigable for great distances inland. Large ships can reach Iquitos on the Amazon, 2,300 miles from the Atlantic, and the Orinoco is navigable for 1,000 miles. It is worthy of note that the Eastern Highlands are rich in gold and diamonds; while the Andes have for centuries yielded gold, silver, copper, and tin. The only important lake is the famous Lake Titicaca, lying 13,000 ft. above sea-level on the Bolivian plateau.

Climate. The greater part of the continent has a tropical climate. North of the Tropic of Capricorn the mean annual temperature is over 80° F., with a range rarely exceeding 10° F., except in the west. South of 30° S. Lat. is the temperate belt, which passes gradually into the southern cold cap, where the mean annual temperature is never over 50° F. No region has a marked continental climate, the greatest range, 30° F., being found in the pampa region west of the Plate estuary. Much of the continent lies in the area of abundant convectional rains, and considerable tracts near the Equator have rains at all seasons; while to the north and south of these are regions which have a season of drought at their winter solstice owing to the swing of the rain belt. The North-east Trades bring relief rains to the coastal district of Guiana, the South-east Trades to the Brazilian coast lands, and heavy relief rains fall on the eastern Andean slopes. On the west coast, in the lee of the Andes, a dry region lies about the Tropic of Capricorn, for here the winds are generally off-shore or parallel to the shore, and arid conditions are heightened by the fact that the cold Humboldt current, which runs up the coast, prevents the evaporation of sea water, and the cool winds passing over it to the warmer land become avid of moisture. To the south of this long coastal desert strip is the region under the influence of the stormy Westerlies; in the belt swept by these winds in winter (June, July, and August), when they extend farthest north, there are winter rains and summer drought. Farther south the land lies always in the track of the Westerlies, and so has rain at all seasons, but the western windward slopes of the Andes receive much heavier rainfall than the eastern leeward slopes. The Bolivian plateau, encircled by mountains, is dry; and in the eastern regions south of the Tropic of Capricorn, cyclonic storms bring a moderate rainfall at all seasons of the year.

Vegetation. The equatorial evergreen forest, the supreme effort of plant life, of dense formation and great height, characterized by its wealth of palms, mimosas, figs, and bamboos, over which creepers twine, and in whose branches epiphytes flourish, covers most of the Amazon basin, where it is known as the Selvas, and is also found on the hot well-watered Atlantic margins of the Guianas and Brazil and along the eastern base of the northern Andes. To the north and south of the forest stretch the savannas, including the llanos of the Orinoco, the caatingas of the northern Brazilian Highlands, the campos of the southern Brazilian Highlands, and the Gran Chaco of the Upper Paraguay. Many

aspects are seen from the typical parkland to the dense scrub formation. The interior temperate plains, called in Argentina the pampas, are treeless grasslands except along the river courses and near the dwellings of man, for the soil is often too loose to hold trees against the high winds, and too compact, dry, and airless for the trees to survive. Southwards and westwards of the pampas the rainfall diminishes and plant life takes a semi-desert character, consisting of thorny shrubs, scattered herbs, and tufts of coarse grass. The well-watered coastal districts, north of the Equator, are well forested, but the dry strip farther south has a typical desert vegetation, the Atacama portion having practically no vegetation, except here and there a miserable acacia bush. Central Chile, with winter rains, has evergreen trees and shrubs of the Mediterranean type; while farther south the wet region has broad-leaved forests in which the typical tree is an evergreen beech. In the tropical regions the Andes display a very well-marked succession of vegetation. Up to 5,000 ft. (*tierra caliente*), wherever the rainfall is heavy, wet jungle occurs; this is followed by a sub-tropical forest (*tierra templada*), less dense, with oaks and tree ferns; this again by temperate forest (*tierra fría*), in which the cinchona tree occurs; while at still higher altitudes appear the paramos, bleak, treeless grasslands, with a few dwarf shrubs; but the higher and drier punas, in the southern tropical regions, are poor steppes, covered with scanty patches of ichu grass.

Economic Conditions. South of 40° S. Lat. hunting and fishing occupy the native races, but in the favoured valleys of Chile agriculture has developed, and sheep-rearing is important in Patagonia and South Chile. The lower part of the Paraná-Paraguay basin, parts of Paraguay and Southern Brazil, irrigated tracts in the extreme west of Argentina, and the highlands in which the São Francisco and Paraná rise, are agricultural lands. Plantations are found round the Brazilian coasts, along the Paraná and Paraguay rivers, and in the Guianas, Venezuela, Ecuador, Colombia, and Peru. The caatingas and campos of Brazil are devoted partly to stock-rearing and partly to plantations. The llanos of the Orinoco and the grassy lands south of the Guiana Highlands support stock, but the great stock-breeding regions are the pampas, Southern Brazil, South Chile, and the Andean plateaux. The forests are, as yet, scarcely exploited. The natives of the forests plant a little manioc, but live by the chase and by bartering forest products with traders. Near the great navigable rivers and wherever European influence has penetrated, there is a considerable intermixture, and a gradual adoption of European civilization. Mineral wealth is great, and is slowly being developed. The continent is important for its nitrates, tin, and copper. Agriculture and stock-breeding are the occupations of the vast bulk of the population. Manufactures are growing in the more populous towns, some on a European scale, but, generally, are in their infancy. South America supplies four-fifths of the world's coffee; a high percentage of the world's frozen and chilled meat, hides, and skins; many of the world's medicinal plants; and a large proportion of the world's wheat, maize, cotton, linseed, wool, cacao, rubber, fruits, sugar, silver, nitrates, tin, iron, copper, and petroleum.

The South American natives have yet to make

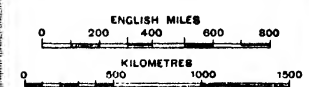
their mark. They need more self-development. They are dependent upon other lands for most of their manufactures, notwithstanding the resources of the continent. Foreign capital has conferred great benefits in the construction of railways and other public works, but for true progress Latin Americans must systematically develop more energy and stability.

Political Divisions. South America is divided into the Republics of Venezuela, Colombia, Ecuador, Peru, Chile, Argentina, Uruguay, Paraguay, and Brazil, and the Guianas, colonies of France, Holland, and Britain.

Colombia. The Republic of Colombia (447,536 square miles; 7,851,000 population) faces both upon the Atlantic and Pacific Oceans, with the Panama isthmus intervening. Rugged Andine mountain territory occupies slightly less than half the area; while the remainder is composed of narrow coastal zones, the enormous llanos east of the Andes, and the largely unexplored, forested, and terraced lands of the Amazon affluents. The bulk of the population is engaged in agricultural and pastoral pursuits, and live on the cool elevated plateaux, avoiding the tropical heat of the plains and the unhealthy, low-lying districts of the lower Magdalena and Atrato. Coffee, the staple product, is widely cultivated, but the coastal districts produce the best quality. In the exportation of bananas Colombia takes third place. Tobacco, cotton, and sugar are cultivated chiefly for home consumption, and sisal and jute are grown on a small scale. Cacao, maize, rice, and yams are products of the hot regions; cinchona rubber, vegetable ivory, medicinal plants, resins and dyewoods of the forests; and wheat and other cereals, and potatoes of the cold regions. Cattle sheep, horses, and mules represent considerable wealth. Probably there are 10,000,000 head of cattle, and given good transport facilities and modern methods of curing and packing, the llanos should become one of the great meat-producing countries of the world. Salt is a Government monopoly, and the salt mines north of Bogotá and the emerald mines of Muzo are a great source of revenue. Platinum is obtained from the alluvial deposits of the Choco River, and it is possible that Colombia may succeed Russia as a source of this metal. The petroleum industry is a relatively recent source of wealth. Transport is mainly by water and by saddle and pack animals on poor roads, for, owing to the difficulty and expense of railway construction, the mileage is only about 1,000. The two main arteries of traffic are the Magdalena and Cauca Rivers (1,100 miles of navigable water), with short railway lines here and there which act as feeders or overcome the difficulties presented by waterfalls. Most of the foreign trade is with the United States, the United Kingdom, and Germany. The chief exports are coffee, bananas, precious metals, hides, rubber, and tobacco; and the chief imports are foodstuffs, textiles, metal goods, machinery, tools, and drugs. The chief towns are: *Bogotá* (235,000), the capital; *Barranquilla* (140,000), the chief port; *Medellín* (120,000) a gold-mining and coffee-growing centre; and *Cartagena* (92,000), a Caribbean port.

Venezuela. The Republic of Venezuela (393,874 square miles; 3,216,000 population) occupies the north of South America from the Gulf of Maracaibo to British Guiana. It is an extremely diversified

SOUTH AMERICA



Principal Steamship Routes.....
Principal Railways ———



region, embodying the highlands and sierras of Guiana, the cordillera of the Andes, and the extensive plains or llanos of the Orinoco, which form some of the wildest territory on the face of the globe. Agriculture is an important industry. On the mountain slopes and the lowlands, cacao, coffee, sugar, tobacco, maize, cotton, indigo, rice, and even barley are cultivated. The tropical forest zone produces rubber, excellent timber, cinchona, balata, chicle, tonga beans, copaiba, and vanilla. On the llanos cattle-raising (3,000,000 cattle) is carried on, and Venezuela should become very important as a meat-producing country. Sheep, horses, asses, and pigs are reared in large numbers. Pearl-fishing is carried on round the island of Margarita. Gold is found in the Yuruari Territory; silver in the States of Lara and Los Andes; copper at Aroa, on the Bolivar Railway; coal at Cora; and iron at Imataca. Asphalt, lead, and tin ore are plentiful. The exploitation of petroleum in the Maracaibo region is very important, Venezuela ranking third or fourth in world production. Roads are primitive, and goods are conveyed on them by pack animals and small mule carts. There are only 625 miles of railway. Most trade is carried on with the United States, the United Kingdom, Germany, France, and Holland. The chief exports are petroleum, coffee, cacao, rubber, sugar, balata, horses, cotton, feathers, iron, coal, oxen, hides, skins, gold, asphalt, pearls, copaiba, and cabinet timber; and the chief imports are provisions, cotton goods, hardware, coal, cement, iron and steel goods, and machinery. *Caracas* (135,000), the capital; *La Guaira* (40,000), the chief seaport; and *Maracaibo* (75,000), a rising port, are the chief towns.

Ecuador. The Republic of Ecuador (110,000 to 276,000 square miles, depending upon the inclusion or otherwise of disputed territories; 1,500,000 to 2,500,000 population) faces the Pacific, where the continent extends farthest west into the ocean. Its coast, 500 miles in length, is regular, broken only by the great Gulf of Guayaquil. Three distinct regions may be distinguished: the western littoral, with steep coastal edge leading to deep water; the twin chains of the Eastern and Western Cordillera with the elevated longitudinal valley between; and the Montaña forested area of the east watered by tributaries of the Amazon. To all intents and purposes, the Republic is dependent for the greater part of its prosperity on the success of the cocoa crop. There are large cacao estates on the east side of the Bay of Guayaquil and on the banks of some of the tributaries of the Guayas. Cacao far outweighs all other products put together, and Ecuador is a strong competitor of West Africa. The banana industry will probably figure considerably in the future. Other agricultural products are coffee, sugar, rice, cotton, tobacco, wheat, barley, maize, potatoes, and fruits. Stock-rearing is important on the Andean basins, and the savannas of the west. The extensive forests supply valuable timber, cinchona bark, rubber, vegetable ivory, toquilla fibre (for Panama hats), and sarsaparilla. Mining is conducted on a small scale. Gold, coal (poor quality), copper, zinc, mercury, lead, iron, emeralds, rubies, and sulphur exist. A British company is developing oil wells on the Santa Elena peninsula. Manufactures are limited to Panama hats, cloth, boots, carpets, matches, cigarettes, cigars, and sugar.

Roads are poor. Llamas and mules are used as pack animals. The main railway, Guayaquil to Quito (287 miles), reaches a height of 10,800 ft. on the Ambato plateau. Most trade is carried on with the United States, the United Kingdom, Germany, and France. The chief exports are cacao vegetable ivory, coffee, Panama hats, hides, rubber, cinchona bark, sarsaparilla, mangrove bark, alligator skins, kapok, sugar, gold, cattle, timber, straw hats, bananas, and other fruits; and the chief imports are textiles, foodstuffs, machinery, clothing, drugs, minerals, cement, vehicles, and hardware. *Quito* (92,000), the capital; *Guayaquil* (120,000), the chief seaport; and *Cuenca* (30,000), an agricultural centre, are the chief towns.

Peru. The Republic of Peru (area between 532,000 and 650,000 square miles; 6,150,000 population) fronts upon the Pacific Ocean with about 1,400 miles of fairly regular coast line. Its physical configuration falls into three distinct zones: the coastal strip, 20 to 100 miles wide, between the Pacific and the Andean foothills, presenting an appearance of desolation and abandonment; the Sierra region of the Peruvian Andes, consisting of the Maritime and Central Cordilleras running parallel to each other on the western side, and the Great Eastern Cordillera, properly called the Andes; and the Montaña forested region of the Amazon, occupying three-fifths of the country. Agriculture in the coast districts is dependent on irrigation; the chief crops are cotton, sugar, maize, rice, and tobacco. Maize, barley, wheat, potatoes, and quinoa are the chief products of the Sierra; and cacao, cinchona, coffee, coca, tobacco, cotton, balata, gums, vegetable oils, and rubber are obtained in the Montaña region. On the mountains and tablelands the alpaca and vicuña roam, and their wool provides a source of wealth peculiar to Peru. Sheep and cattle are reared in large numbers. Silver is mined at Cerro de Pasco and Puno; mercury at Huancavelica; and copper at Puno and Yauli. Small quantities of guano are obtained from the islands of Lobos de Afuera, Gualaípe, Macabi, and Malabrigo; and 90 per cent of the world's vanadium comes from Peru. Important petroleum deposits have been discovered, and the output is increasing greatly, especially in the desert between the rivers Tumbes and Chira. Straw hats are plaited in the north, and at Lima, Arequipa, and Cuzco, coarse woollen blankets and cloth are woven. Good roads are lacking, and mules and llamas are used as pack animals. There are 2,200 miles of railway. Trade is carried on chiefly with the United Kingdom, the United States, Germany, and Japan. The chief exports are sugar, cotton, petroleum, skins, hides, coca leaves, wool (llama, alpaca, vicuña, sheep), copper, gold, silver, rubber, vanadium, copra, and guano; and the chief imports are textiles, iron and steel goods, coal, wood-work, drugs, earthen and stone wares, machinery, explosives, oils, stationery, timber, wheat, and paper. The chief towns are: *Lima* (265,000), the capital and chief commercial centre; *Callao* (77,000), the chief port; *Arequipa* (40,000), an agricultural centre; *Cuzco* (35,000), the old capital; *Iquitos*, Amazon port; and *Payta*, the northern port.

Bolivia (514,155 square miles; 2,911,000 population) has no seaboard. It is bounded on the north and east by Brazil, and on the south by Argentina



and Paraguay. Only one-fifth of its people live in the fertile zones below an altitude of 10,000 ft., and the development of civilization has been small. Western Bolivia is occupied by a high plateau, the Puna (average altitude over 12,000 ft.), hedged by the Cordillera Occidental, and the Cordillera Real. Agriculture and mining are the principal industries. The Indian of the high plateau produces scanty crops of barley, quinoa, and potatoes. In the valleys of Cochabamba wheat, maize, and semi-tropical and temperate fruits—oranges, custard apples, figs, grapes, and pears—are grown for local use. The rich soils of Santa Cruz and the Yungas produce coffee and cocoa of the finest quality, sugar-cane, mandioca, tobacco, long-stapled cotton, coca of high cocaine content, cinchona, and a large variety of fruits. Sheep, llamas, and alpacas are reared on the higher slopes, and cattle on the savannas. Rubber is collected in the forests of the north. The incalculable mineral resources of the highlands, especially those of the Cordillera Real and its branch mountain ranges, where the lodes lie from 11,000 ft. to 16,000 ft. high, are being exploited, though suffering from poor transport facilities. Tin, copper, silver, gold, wolfram, and bismuth are being mined in increasing quantities. Silver is usually found in conjunction with tin. From the mines of Potosi and Oruro it has been estimated that silver to the value of £600,000,000 has been extracted, but the output now is small; and tin (25 per cent of the world's supply) is easily first in value of output. Roads, worthy of the name, do not exist, and, apart from the railways, transport is by llama, coaches, and carts over rough and hilly tracks. Much of the foreign trade passes through the Peruvian port of Mollendo and the Chilean ports of Arica and Antofagasta; and the United States and the United Kingdom are Bolivia's best customers. The chief exports are tin, silver, and lead ores, antimony, bismuth, wolfram, rubber, Peruvian bark, wool, gum, coca, cocoa, coffee, and hides; and the chief imports are iron and steel goods, textiles, machinery, sugar, flour, cattle, and coal. *La Paz* (111,000), the seat of Government, and the commercial capital; *Sucre* (34,000), the constitutional capital; *Oruro* (40,000), the centre of the tin-mining industry; *Potosi* (34,000), a silver-mining centre; and *Cochabamba* (36,000), an agricultural centre, are the chief towns.

Chile. The Republic of Chile or Chili (285,133 square miles; 4,288,000 population), one of the most progressive states of South America, lies between the Andes and the South Pacific Ocean, extending coastwise for 2,500 miles from the Arica bend to Cape Horn. Closely shouldered by the high, snow-peaked wall of the Andes, the country consists of a long, narrow strip, varying in width from 50 to 140 miles, except close to the northern and southern extremities, where it widens to 250 miles. The chief industry is mining, the country supplying nearly all the world's consumption of natural nitrate of soda, and ranking second (9 to 11 per cent of the world's copper) among the copper-producing countries of the world. Nitrate deposits are found throughout an area running for 450 miles in the north at a distance of from 15 to 90 miles from the desert coast, and at a height of from 3,500 ft. to 13,000 ft. In the best years the exports have amounted to 2,000,000 tons, and there are

240,000,000 tons "in sight." Among the big developed copper camps, largely in the hands of Americans, are Chuquicamata, Potrerillos, and El Teniente. The folds of the Andes furnish gold, silver, nickel, sulphur, bismuth, manganese, graphite, and cobalt; and guano, borax, and iodine are products of the Atacama region. In the Provinces of Concepcion and Arauco, about 1,200,000 tons of soft coal are raised annually, supplying most of the country's needs; and farther south are deposits of petroliferous shales, accompanied by pockets of natural gas. Iron ore is worked in Atacama and Coquimbo Provinces, the latter possessing a wonderful hill of iron at El Tofo. It is estimated that Chile contains 1,000,000,000 tons of iron ore. Agriculture ranks next to mining. Though only one-sixth of the land is suitable for cultivation, Chile, nevertheless, produces practically all its own requirements in foodstuffs, and has an important export of certain products. The smiling Central Valley furnishes wheat, barley, oats, maize, beans, lentils, Mediterranean fruits, tobacco, flax, hemp, wine (the best in South America), Chile pepper, and potatoes. Sheep-rearing is important, especially in the south. One company alone runs over 3,000,000 sheep (total for the country, 4,500,000). Hardy cross-breeds of Romney Marsh type thrive in cold Magellanes, furnishing an important export of long wool and frozen mutton. Cattle number over 2,000,000; and both butter and cheese are made; and hides are exported. Of other live stock there are 450,000 horses, 300,000 goats, 300,000 pigs, and 45,000 alpacas. There are manufactures of cotton cloth (woven from Peruvian cotton), biscuits, matches, soap, starch, beer, wine, paper, aerated waters, ships, freight cars, steel and iron castings, furniture, leather goods, cordage, and candles. Insufficient attention has been given to the Chilean roads; but the railways (5,600 miles) are good, though politically exploited and wastefully managed. Coastwise traffic is carried on by the growing mercantile marine, and over a dozen shipping lines place Chilean ports in direct communication with North America and Europe via the Panama Canal and Magellan Strait. Most of the foreign trade is with the United States, the United Kingdom, Germany, and Argentina. The chief exports are nitrate of soda, copper bars and ores, silver and iron ores, iodine, borate of lime, wool, meat, hides, wheat, flour, barley, oats, beans, honey, and wine; and the chief imports are textiles, hardware, machinery, transport materials, coal, sugar, sacking, petroleum, dyes, and foodstuffs. The chief towns are: *Santiago* (696,000), the capital and leading commercial centre; *Valparaiso* (193,000), the chief seaport; *Concepcion* (78,000), the commercial centre for the south; *Antofagasta* (54,000), the commercial centre of the nitrate industry; *Iquique* (47,000), the chief nitrate port; *Valdivia* (34,000), a river port; *Magellanes* (24,000), a coaling and repairing station; *Talca* (45,000), an inland agricultural centre; *Chillan* (31,000), a pastoral centre; and *Talcahuano* (22,000), the port of Concepcion.

Paraguay (area, exclusive of the Chaco Territory, 61,647 square miles; 852,000 population) is an inland country, lying for the most part between the rivers Paraná and Pilcomayo. The great River Paraguay divides the country into the mountainous Paraguay Oriental and the low-lying, level, Paraguay Occidental (El Gran Chaco). Most of the

country is a rich savanna land, with fairly dense woods along the river valleys. Scrublands are found in the drier areas, groves of quebracho in the west, and mixed jungle forests on the eastern hillslopes. The pastoral industry and forestry are the chief industries. Both climate and pasture favour the cattle industry (5,000,000 head of cattle), and progress has recently been made, chiefly owing to the importation of improved breeding stock from Argentina and to the establishment of meat extract and packing plants. Of fair average quality only, the Paraguayan cattle are, as yet, better adapted for use in the jerked beef and meat extract factories than to the frozen meat trade. The immense forests yield quebracho (for railway sleepers or tanning extract), dyewoods, gums, rubber, and medicinal plants. Among the chief agricultural products are oranges (of excellent quality), tobacco (black and strong), yerba maté or Paraguayan tea, maize, beans, coffee, rice, cassava (manioc), cotton, sugarcane, ground nuts, and sweet potatoes. Iron is found at Ibicui; manganese at Quiquió and Ibicui; copper at San Miguel and Quiquió; and limestone and marble in a few areas. Most of the country roads are mere bullock tracks, and the railway mileage is only about 550. Most trade is with the United States, the United Kingdom, Argentina, Brazil, Germany, and Uruguay. The chief exports are hides, timber, yerba maté, tobacco, oranges, canned and preserved beef, quebracho extract, cattle, sugar, and *petit* grain oil; and the chief imports are textiles, foodstuffs, machinery, iron and steel goods, beverages, and chemicals. *Asunción* (100,000), the capital and chief trading centre; and *Villa Rica* (26,000), an agricultural centre, are the chief towns.

Uruguay (72,153 square miles; 1,903,000 population), the smallest South American Republic, is bounded on the north by Brazil, on the east by the Atlantic Ocean, and on the south and west by the rivers Plate and Uruguay. Its surface is a well-watered, undulating, grassy plain, broken only by several low mountain ranges of an average height below 2,000 ft. Agriculture is extending, but ranks after stock-raising. Wheat (1,025,000 acres) is the most important crop; but maize (500,000 acres), millet, oats, rye, and flax are also grown. Vine, olive, and tobacco cultivation and fruit-growing are becoming important. Mining is developing; gold mines are worked in the north (the Department of Rivera); and silver, lead, copper, talc, diamonds, magnesium, and lignite are found. The pastoral industry is of prime importance, especially in the Departments of Salto and Paysandú. Some 60 per cent of the land is devoted to stock (30,000,000 acres of pasturage). There are 8,500,000 cattle, and 14,500,000 sheep. The rich pampa soils, with their phosphates and alkaline silicates, are well suited to cattle-rearing. Meat packing and the making of meat extracts are important at Paysandú, Montevideo, Mercedes, Salto, and Fray Bentos. Roads are good, and there are 1,700 miles of railway. The chief railway connects Montevideo and San José. Most trade is with the United Kingdom, the United States, Argentina, Germany, France, Italy, Brazil, and Belgium. The chief exports are living animals, extracts of meat, chilled and frozen beef, frozen mutton, stone, fish, maize, hides, tallow, horns, bone ash, wool, skins, wheat, and rubber;

and the chief imports are textiles, apparel and haberdashery, iron goods and machinery, coal, oil, fuel, liquors, timber, and foodstuffs. *Montevideo* (482,000), the capital and chief trade centre; *Paysandú* (26,000), *Salto* (30,000), *San José*, *Santa Rosa*, and *Fray Bentos* are the chief towns.

ARGENTINA

Position, Area, and Population. The Republic of Argentina, the land of the Pampa, and the most progressive country in South America, has an area of 1,153,119 square miles, and stretches through a length of 2,300 miles. From its widest part, nearly 1,100 miles, it thrusts a broad rectangle northwards into the tropics; southwards it tapers to the point of the continent and to icy island cliffs weathered by Antarctic seas; while to the west tower the volcanic snowy peaks of the Andean Cordillera. For nearly 2,000 miles its western boundary is the gigantic barrier of the Cordillera, while on the east the Atlantic borders it for 1,500 miles. Immigration from the Latin countries of Europe gives a net yearly influx of 60,000 to its population, which is estimated at 11,400,000. The Argentine people are more vigorous, enterprising, and persevering than other South American people, with the exception of the Chilians; they are shrewd at bargaining, and usually well informed in world topics; they are proud and patriotic, but have not yet developed an Argentine soul, art, or literature.

Relief. Argentina may conveniently be divided into the Plate lands, the Pampas, and the Patagonian plateau. The Plate lowlands lie north and north-east of the La Plata estuary, and pass by gradations to the hilly regions of South Brazil. They are watered by the Paraná, Paraguay, Pilcomayo, and Uruguay, which form the River Plate itself. To this great river Argentina owes its distinct economic and political unity. Southwards from the low flat shore of the River Plate to 40° S. Lat. stretches the vast plain of the Pampa, the bed of the ancient Pampean Sea, and the maker of modern Argentina. Once covered with coarse grass which supported only scanty Indian tribes, the Pampa has passed through the reign of the gaucho, tending vast herds on unenclosed land, to the modern age of fenced estates, machinery, tillage, and neat estancia houses. To the eye it presents an unbroken flat immensity; in reality it is not dead flat, but sweeps in long undulations, with frequent lagoons and swampy places. Westwards it rises imperceptibly towards the Sierra de Córdoba and the foothills of the Andes, and southwards it is broken by the Sierras de la Ventana and de Tandil. In the west of Córdoba the soil is covered with low scrubby wood; but the far more extensive plain, treeless except along the river courses and round the estancia houses, with its fertile, deep soil, always moist below the surface, furnishes 250,000,000 acres of arable land—the famous cereal zone which stretches from the Rio Salado to the Rio Colorado. The Patagonian plateau, which descends from the Andes to the Atlantic and extends southwards from the Pampa to the Strait of Magellan, was once thought to be mere barren waste; but has been found to be interspersed with fertile valleys, fine sheep pastures, and dense temperate woods.

Climate and Vegetation. Argentina is a temperate land in a tropical continent, designed by Nature for

the seat of a populous and prosperous civilization. The climate of the central region, as generally of the lands west of it, resembles that of South Europe, and is, therefore, congenial to immigrants from Spain and Italy. Near the Atlantic coast the cold never exceeds a slight frost, and summer heat, though occasionally oppressive enough, is never extreme. The interior has a more continental climate, with more intense summer heat, summer rainfall, and occasional cold storms in winter and spring, sometimes even driving snow which melts as it falls. The cereal region suffers from sudden great variations of temperature when the cold pampero sweeps from the south-west over the plain. In the more settled districts the climate varies less than might be expected in view of the range of latitude. The mean temperature of the twelve chief towns from Tucumán to Bahía Blanca varies between 60° and 70° F., and their maximum temperature between 100° and 111° F. Patagonia has only a slight rainfall, and its winter is bleak. The west is not at all well-watered, and the north-west is arid with tropical temperatures modified by the altitude.

The vegetation includes the rich grasslands of the Pampa, the poorer type of Patagonia, the monte or low woods of Córdoba, the tropical hardwood forests of the Gran Chaco in the north-west (noted for quebracho), and the temperate forests of the south.

Productions and Industries. The greatest wealth of Argentina lies in grain production, and to a lesser extent in stock-rearing. Capital from abroad, largely British, established the railway system; and the vigour of the people led to the erection of the *frigoríficos* (which started the country on the road to riches), and has lately created new wealth through the extension of scientific farming, both pasture and tillage. About 400,000,000 acres are available for agriculture or cattle-rearing. Of this vast area some 60 to 70 million acres are under cultivation (wheat, 20·7; linseed, 8·6; maize, 14·0; oats, 3·8; figures in million acres), producing about 6,000,000 tons of wheat; 5,000,000 tons of maize; 1,000,000 tons of oats; and over 1,000,000 tons of flax per annum (the export of flax seed is the largest in the world). The best wheat lands lie generally to the south of a line drawn from Buenos Aires to Rosario and Córdoba, and there has been a noteworthy southward movement of the centre of production. Owing to climatic causes, the northward limit of wheat has been reached, but in the south and west this limit has yet to be determined. The live stock includes 37,000,000 cattle; 44,000,000 sheep; 10,000,000 horses; 5,600,000 goats; and 3,100,000 pigs. Sheep are reared south-east of a line from Buenos Aires to Bahía Blanca, and are rapidly increasing under the control of Scotch shepherds in Patagonia. They are largely cross-breeds, bred for mutton and wool, the wool being of medium quality, and totalling 200,000 tons per annum (one-eighth of the world's wool). In the interfluvial Santa Fé and Buenos Aires provinces one-fifth of the world's cattle are reared; and more beef, frozen and chilled, is supplied to Europe by Argentina than by any other country. Over 90 per cent of the country's exports are from farm products, and it is the east which produces nearly all the cereals and contains most of the farm animals. There are many well-appointed stock farms, growing alfalfa for their high-grade animals, and causing the disappearance of the

romantic gaucho. Most of the land is still held in enormous blocks by landlords, who cannot use their estates to anything like the best advantage, and are glad to employ on share systems Italian and Spanish immigrants, whose farming methods are poor. These huge estates are destined to be subdivided, and cattle will tend increasingly to displace sheep. Dairy herds are increasing, and much good butter is produced. The chief curses of agriculture are the long droughts which occasionally occur, when the pastures turn to dust and the beasts die for want of herbage; and the hosts of locusts coming from the tropical interior about once in seven years, which fly over the land in dense clouds, shut out the sky, and eat up all vegetation. In the warm north and north-west, by means of irrigation, sugar, tobacco, cotton, and grapes are produced. The export of wine to neighbouring republics is increasing annually. Timber is cut in the Chaco, and tanning extracting factories have been established there.

Minerals, abundant and various, chiefly in remote hills and mountains, await development and transport. Much wealth, from the borax and copper of the north to the gold of the far south, is concealed in the Cordillera. The chief industrial establishments are those closely connected with the primary occupations of tillage, pasture, and forestal exploitation. There are flour-mills, dairies, wine presses, sugar refineries, tobacco factories, tanning extracting factories, meat-freezing establishments (*frigoríficos*), and sun-dried meat factories (*saladeros*). During the Great War the restriction of imports gave an impetus to the manufacture of textiles and leather, which still survives.

Communications and Commerce. The River Plate system serves as a channel of commerce with adjoining republics, and of internal trade as well; while the Plate estuary, at the southern end of the riverine trough, is the main outlet of the country. Dredging operations in the rivers make it possible for the interior of the country to be in close touch with sea communications; and the needs of trade are served by many lines of steamers linking Argentine ports with those of Europe and the United States. Railways are spreading in all directions, but uniformity of gauge is lacking. The system, 23,000 miles in length, and almost entirely in the hands of British companies, radiates from Buenos Ayres, intersecting the Pampa in all directions, and gathering to a second nucleus at Rosario, and a third at Bahía Blanca. Roads are poor, especially on the Pampa, which resists the making of roads. Motor traffic, however, is leading to improved roads. Several aeroplane services serve various Argentine centres, and the capitals of neighbouring republics.

Argentina has a considerable trade in foodstuffs with the neighbouring lands, but this traffic is easily eclipsed by the exports of meat and cereals to the manufacturing centres of Western Europe. The exports are almost entirely of pastoral and agricultural products (frozen mutton, frozen and chilled beef, wool, hides, skins, tallow, butter, wheat, maize, flax, linseed, oats, wine, and tobacco), the only exceptions being quebracho, copper, manganese, and wolfram; and the chief imports are iron and steel and wares made from them, cotton and woollen goods, groceries, coal, and railway material.

Trade Centres. Nearly half the population are town-dwellers, although the basis of Argentine life

is rural. The chief towns are: *Buenos Aires* (2,149,000), the capital and chief seaport; *Rosario* (481,000), the great grain port; *Córdoba* (253,000), the centre of the cattle-rearing industry of the Pampa; *La Plata* (166,000), an important port; *Bahía Blanca* (44,000), a great grain port and naval station; *Tucuman* (91,000), the centre of the sugar industry; *Mendoza* (59,000), the chief centre of trade between Argentina and Chile; and the river ports of *Paraná*, *Santa Fé*, *Corrientes*, and *Concordia*.

Mails. Buenos Aires is 7,160 miles from Southampton. There are various mail routes, and the time of transit is about 22 days.

Foreign Possessions. *British Guiana* (89,480 square miles; 312,000 population, mainly East Indians and Africans) is a British Crown Colony, lying between Venezuela and Dutch Guiana. Its

chief products are sugar, cacao, coconuts, coffee, bananas, maize, gold, timber, phosphates, balata, diamonds, pepper, and rice. Georgetown (56,000) is the capital.

The Falkland Islands (British), situated about 480 miles north-east of Cape Horn, have a scanty population of 3,300 Europeans. Wool is the chief product. Port Stanley (900) is the only important settlement.

Dutch Guiana (54,291 square miles; 153,000 population) produces sugar, molasses, cocoa, coffee, rum, gold, timber, balata, hides, and pepper. Paramaribo (46,000) is the capital.

French Guiana or Cayenne (34,740 square miles; 44,300 population) produces rice, maize, manioc, cocoa, coffee, sugar, indigo, tobacco, and gutta-percha. Cayenne (11,000) is the capital.

Position, Area, and Population. Brazil, the most extensive republic in South America, lies almost entirely in the tropics, and its Northern States are crossed by the Equator. Bounded on the north-east and east by the Atlantic Ocean, Brazil has land boundaries with every country of South America except Chile. Its total area is 3,275,510 square miles, or about twenty-six times the size of the British Isles. No satisfactory statistics of population are available; probably the number approaches 40,000,000, comprising Europeans, descendants of the original Portuguese settlers (about 37 per cent); races of mixed blood (about 37 per cent); negroes, descendants of African races brought over to supply the labour on the various plantations (about 20 per cent); and Indians inhabiting the *selvas* (about 6 per cent). Very thinly populated regions are the *selvas* and the sterile *campos*; and the most densely populated regions are the agricultural and mining regions of the east. Whites predominate in the south, and mestizos in the north and centre. Immigration has been fairly great; Latin races in the north; Germans, Poles, Austrians, and Jews in the south.

Coast Line. The republic possesses fully 4,000 miles of coast, but this not only compares unfavourably with that of great maritime countries, but is also deficient in really good harbours, and is diversified by few islands or deep inlets, the only inlets of note being the estuary of the Amazon, the Gulf of Bahia, and the Bay of Rio de Janeiro. The northern coast is low and swampy, and dangerous shoals and quicksands and exposure to the trade winds add to the difficulties of navigation. South of the Amazon estuary, the coast is bordered by a sandstone reef as far as 20° S. Lat. In the "elbow," Cape San Roque is the nearest point to the African coast. Beyond 20° S. Lat. a series of lagoons runs parallel to the sandy coast, except where the mountainous spurs of the Serra do Mantiquiera provide several magnificent harbours, notably that of Rio de Janeiro.

Relief. Broadly speaking, Brazil falls naturally into two main physical regions of unequal extent: (1) the Eastern and Central Uplands, forming an "island" of mountains and plateaux, surrounded by rivers and the Atlantic Ocean, representing all that now remains of the ancient Brazilian Highlands, and occupying 700,000 square miles; and (2) the Northern and Western Lowlands, which have replaced a vast inland sea. The Brazilian Highlands, formed of hard, ancient rocks, are enclosed between the Atlantic Ocean and the valleys of the Paraguay-Paraná-Plate and the Amazon-Madeira-Guaporé. They represent the remains of a worn-down and river-dissected mighty mountain mass, and form three chief connected systems: the Sea Mountains (*Serras do Mar*), extending along the coast from 22° to 30° S. Lat.; the Backbone (*Espinhaço*), an extension of the Sea Mountains, projecting inland towards the basins of the Paraná and São Francisco; and the Water Partings (*Vertentes*), dividing the head-waters of the Paraná from those of the Tocantins and the São Francisco. The average height of the Highlands is about 3,000 ft. They fall abruptly to the Atlantic, and gently incline towards the Amazon and Paraná. A large part of the more elevated portions of the interior forms *campos*, which are classified as *campos cerrados* ("closed

plains"), consisting of grassy plains, dotted with numerous small groves, woods or thickets, and generally of a park-like appearance; and *campos abertos* ("open plains"), covered with little except grass and scrubby vegetation. The Lowland Regions comprise mainly the Amazon tropical forest lowlands (*selvas*), an area about two-thirds that of Europe. Other lowland regions include the hot and well-watered coastal strips; the upper Paraguay-Paraná region, with rich savanna vegetation varied with occasional woodland; and part of the temperate grassy plains of the lower Paraguay-Paraná region.

Climate. The climate, generally speaking, is typically tropical, except where modified by altitude and latitude; but three zones may be distinguished: the strictly tropical regions (three-quarters of the republic), comprising the States of Pernambuco, Parahiba, Rio Grande do Norte, Pará, Ceará, Piauí, Alagoas, Sergipe, Maranhão, Amazonas, and parts of Bahia, Espírito Santo, Goyaz, Minas Geraes, and Matto Grosso; the sub-tropical regions comprising much of the States of Paraná, Rio de Janeiro, São Paulo, and the uplands of Bahia, Minas Geraes, Goyaz, and Matto Grosso (one-fifth of the republic); and the temperate regions comprising the States of Santa Catharina, Rio Grande do Sul, and the southern part of Paraná (one-twentieth of the republic). The climate of the central Amazon Valley is characterized by its excessive heat (sometimes 106° F. in the shade), and copious rainfall (about 90 in. annually). Two branches of the South Equatorial Current raise the temperature of the coastal districts, and practically the whole of Brazil has a mean annual temperature of 70° F. and over. The only comparatively dry area (annual rainfall 15 in. to 25 in.) is the middle basin of the São Francisco, which is robbed of its moisture by the barrier of the Brazilian Highlands. Elsewhere the trade winds deposit heavy rainfalls.

Land and Water Routes. Brazil is unequalled for the number and extent of its rivers; the longest, the Amazon (nearly 4,000 miles long), drains a greater area (2,000,000 square miles of alluvium), and has a greater volume than any other river in the world. It is formed by the union of two head streams, the Marañon rising in Lake Lauricocha in Peru, and the more southerly Ucayali. These rivers and the Huallaga flow northwards, and descend from their lofty sources in a series of cataracts and rapids. They finally turn eastwards, breaking through the Eastern Andes to the lowlands, and at their junction the united stream is known as the Amazon. The river now winds its way through the greatest primeval forests of the world, receiving many tributaries on its way to the Atlantic. Of those from the north, the largest is the Rio Negro. The Jurua, Purus, Madeira, Xingu, Tapajos, and the Tocantins come from the south. The southern tributaries are flooded in the southern summer, when the rain belt swings southward, and at this time the volume of the great river is greatest; but its mean level is fairly constant throughout the year, for the northern tributaries are flooded in the northern summer. The main stream, bearing many verdant islands on its bosom, is often miles in width, and is navigable to where the Marañon issues from the eastern wall of the Andes. No delta is formed by the Amazon, but a great estuary, which for the last 250 miles is 50 miles wide, and at its mouth as



much as 500 miles. Up this tunnel the tide rushes for 500 miles, often with great violence, and its influence is felt as far as Obidos, 75 miles above the junction of the Amazon and Tapajos. Of the two principal mouths of the Amazon, which are separated by Marajo Island, the southern or Pará mouth, with its narrow and intricate winding channels, is utilized by steamers.

Generally, the means of communication are poor. Roads are often bridle paths or mere tracks; the rivers have falls and rapids; and the railways (20,000 miles) are inadequate for so vast a country, and are not on a uniform plan or gauge. The Amazon and its tributaries, however, give access to otherwise practically impenetrable regions, and provide many thousands of miles of navigable waterways, the Amazon itself being navigable for small boats without interruption to the foot of the Andes (2,600 miles), and for ocean-going steamers to Mañaos (more than 1,000 miles). The Paraná-Paraguay provides a convenient southern outlet. Canalization and railway construction in the future will doubtless provide a complete eastern and western route between the Atlantic and the Pacific. At present, the railways run mainly westward for short distances from the ports of Rio de Janeiro, Santos, Porto Alegre, Bahia, and Pernambuco. Coasting trade is limited by law to Brazilian ships, and is chiefly in the hands of the New Brazilian Lloyd. Many foreign steamship lines ply to the ports of Rio de Janeiro and Santos (coffee, the pre-eminent export); Bahia and Pernambuco (cotton, cocoa, sugar, and tobacco); Pará, Maranhão, and Ceará (forest products); and Rio Grande do Sul, Porto Alegre, and Pelotas (animal products).

Productions and Industries. Brazil may be described as a sleeping giant, for its vast area and natural resources are little utilized. Development will come when more capital is expended; when a greater population is secured; and when the labour material of well-developed countries finds its place on Brazilian soils. The selvas will long prove a barrier to civilization, but men's ingenuity will finally conquer them.

Agriculture. Agriculture is one of the mainstays, but only a small fraction of the land is under cultivation. Coffee is the most important product, about 80 per cent of the world's supply being raised. The coffee tree grows best at an elevation of 3,000 ft. to 4,000 ft., and requires heat, considerable moisture, and a soil rich in humus. For these reasons, and because it is grown so largely for export, the chief coffee regions are on the seaward slopes of the Serras do Mar, the producing States being Rio de Janeiro, Minas Geraes, São Paulo, and Espírito Santo. The cacao tree requires a deep soil, and great heat and moisture. It is mainly grown in the States of Bahia, Pernambuco, Maranhão, Ceará, and Piauí. Sugar is an important commodity, and is produced in the States of Pernambuco, Bahia, and Rio de Janeiro, where the soil has the necessary lime constituent. Cotton is cultivated in the northern States of Ceará and Pernambuco; tobacco in Bahia and Goyaz; and yerba maté or Paraguay tea in the Southern States. Rice, manioc (tapioca), beans, maize, sweet potatoes, yams, bananas, figs, and oranges are grown under conditions of primitive agriculture, chiefly for local needs.

The Pastoral Industry. The pastoral industry is

becoming of increasing importance. Vast herds of oxen and numerous horses feed on the grassy campos, and the temperate grassy plains of the south. The total number of cattle approaches 34,000,000, and the State of Rio Grande do Sul takes the lead. The quality of the cattle has been improved recently by crossing them with cattle specially imported from India. Pigs and sheep are also fed in large numbers.

Forestry. The vast Brazilian forests yield a variety of products. Rubber is the most important commodity; but the area from which it is obtained is receding from the main streams, and attempts are being made to cultivate it in Grão Pará. The chief collecting and distributing centres for rubber and other forest products are Mañaos, Obidos, Santarem, Pará, Maranhão, and Ceará. Among the typical forest products are vanilla, sarsaparilla, cinchona bark, cacao, Brazil nuts, tamarinds, balsams, gums, dyewoods, beautiful cabinet woods, and woods suitable for shipbuilding. The timber industry is of minor importance. Uncivilized tribes of Indians fish in the rivers; hunt the few game; collect the produce of the forests; and at the edge of the forests practise a little primitive agriculture.

Mining. The mineral resources are great, but mining is practically undeveloped, owing to poor transportation facilities and a lack of suitable labour. Brazil was formerly noted for its diamonds, but has lost much of its old importance since the discovery of the South African diamond fields. Gold and diamonds are worked mainly in the alluvial lands with their centre in the State of Minas Geraes. In the same localities there are also found mercury, copper, zinc, manganese ore, and precious stones—topaz, amethyst, beryl, tourmaline, and agate. True coal, mostly soft and unsuitable for the furnaces, exists in a continuous form from the State of São Paulo into and across that of Rio Grande do Sul, and lignite is found in Minas Geraes. Vast quantities of iron ore in Minas Geraes are little utilized. Magnetite is found in Paraná and Santa Catharina; and petroleum in workable quantities has been discovered in Rio Grande do Sul and Santa Catharina. The production of manganese in Minas Geraes, and of monazite sand in Espírito Santo, deserve special mention.

Manufactures. The manufactures are steadily progressing, and are fostered by heavy protective duties. Cotton and woollen manufactures are carried on at Rio de Janeiro, Nictheroy, Maranhão, Porto Alegre, and Rio Grande do Sul, and silk manufactures at Petropolis. The cotton-spinning industry supplies almost the entire demands of the home market. Sugar refineries, "saladeros," meat-freezing establishments (created by the conditions of the Great War, and still surviving), tanneries, breweries, distilleries, and fruit-preserving establishments represent the remaining manufactures. The motive power of the majority of the textile and other mills is electric, and the abundant water-power is now used on a small scale.

Commerce. The exports of Brazil are all the products of extractive industries, and include coffee, frozen and chilled meat, rubber, cotton, hides, skins, leather, tobacco, cacao, maize, beans, maté, sugar, timber (cabinet and other), diamonds, gold, nuts, and manganese and zinc ores. Most of the imports are subject to high duties. The chief are cottons,



iron and steel work, machinery, coal, wheat, flour, wine, leather, jerked beef, fish, woollen goods, and rum. Most of the trade of Brazil in the past has been with the United Kingdom, the United States, Germany, France, Italy, Portugal, Argentina, and Uruguay.

Trade Centres. The history of Brazil is the story of settlement on the Atlantic coast, and on the adjacent or eastern portion of the tableland; hence all the great towns, except São Paulo and Manãos, are situated on the coast. There are thirteen towns with populations exceeding 30,000, and seven of these have over 100,000. The chief are: *Rio de Janeiro* (1,469,000), the present federal capital, and the second city of South America; *Sao Paulo* (880,000), the headquarters of the coffee industry;

Bahia or *San Salvador* (330,000), the ecclesiastical capital and the second port; *Pernambuco* or *Recife* (341,000), the chief sugar port; *Pará* or *Belem* (280,000), Amazon port; *Porto Alegre* (273,000), the capital of Rio Grande do Sul; *Niteroy* (86,000), a textile centre; *Ceará* or *Fortaleza* (79,000), a port; *Santos* (125,000), a coffee port; *Manãos* (76,000), a centre for forest products; *Macéio* (74,000); *Parahyba* (53,000); and *Maranhão* or *São Luiz* (53,000).

Mails and Time. There is a regular weekly mail service to Brazil. Rio de Janeiro is about 5,750 miles distant from Southampton, and the time of transit is about 17 days. To Pernambuco the time is three days less. Since the longitude of Rio de Janeiro is about 45° west, the time is, roughly speaking, three hours behind that of Greenwich.

Position, Area, and Population. Australia, the largest island but the smallest continent, with its southern satellite, Tasmania, stands aloof in situation from the world at large, lying, unlike the other great land masses, wholly within the southern water hemisphere, without either encroaching on the equatorial region or approaching, even remotely, the Antarctic Circle. It is a very compact, kidney-shaped island, which is almost halved by the Tropic of Capricorn. To the north the East Indies form a series of stepping-stones between Australia and Asia; to the east is the island-strewn Pacific; in the south the wide belt of the Southern Ocean separates it from Antarctica, whilst the Indian Ocean washes its western shores. From Cape York, in the north, to Wilson Promontory, in the south, the distance is nearly 2,000 miles; and from Steep Point, in the west, to Cape Byron, in the east, is 2,300 miles. The area of the continent is approximately 3,000,000 square miles; but its population, most of whom are concentrated in the eastern and south-eastern parts, numbers only about 6,501,000. Ninety per cent are British or of British descent (there are about 66,000 aborigines), and their White Australia Policy excludes Asiatics. They hope to develop even the tropical parts by means of white labour.

Coast Line. The coast line is over 12,000 miles long, just twice the minimum perimeter, and, on the whole, is regular, like those of the other southern continents. The Great Australian Bight and the Gulf of Carpentaria divide the continent into an eastern and western half, differing in aspect and physical conditions. In the western half, the coast is more angular, studded with bold promontories; more and larger estuaries, but fewer rivers; and long tracts show no sign of drainage to seaward. The eastern half shows more available harbours, roadsteads, and rivers, together with some 1,500 miles of inland navigation.

Outside a large extent of the eastern coast runs the coral Great Barrier Reef, 1,200 miles long, from 25 to 35 miles from the coast in the north, and from 60 to 120 miles in the south. Through it there are several good passages for ships, and navigation inside the reef, where the channels are well lighted, is safe and pleasant. During the winter months large and well-appointed steamers carry thousands of tourists from the south to the northern ports of Queensland.

Relief. Australia consists of three main physical divisions—the Eastern Highlands, the low Western Plateau, and the Central Lowlands. The Eastern Cordillera, or highlands, are not folded ranges, but consist of an ancient highland mass, which was worn down, and then uplifted. They stretch from Cape York to the mouth of the Murray, a distance of 2,000 miles, and rise abruptly from the sea. The highest portions of the mass are in the south-east, where mountain groups are closely grouped. Running under different names in different parts—the Darling Downs, the Blue Mountains, and the Australian Alps (Kosciusko, 7,328 ft.)—this Great Dividing Range makes east-west railway construction most difficult, and prevents sea winds from penetrating the interior. On the west of the continent an ancient "coign" extends from the west coast eastwards for 1,400 miles, its eastern boundary following a sinuous line from Spencer Gulf to the Gulf of Carpentaria. The surface of the tableland

is generally level, and has an average elevation of over 1,000 ft. Between the Western Plateau and the Eastern Highlands stretch the Central Lowlands, the uplifted bed of a primeval sea. Except for a belt in the north, it is below 600 ft., and in the region of Lake Eyre actually below sea-level.

Although a physical map shows a fairly imposing array of rivers on the east, Australia is remarkable for the rarity and small size of its rivers in proportion to the extent of the land. Many streams are, during most of the year, a series of detached pools connected by dry water channels, and frequently they have bars at their mouths. Rivers which have no perennial or permanent sources are called "creeks"; they often flow into lakes, or lose themselves in the sands and wastes. Among these "creeks" are the Macumba, Diamantina, and Cooper, draining at certain seasons to Lake Eyre (40 ft. below sea-level). The Murray-Darling system is the only natural means of inland navigation, and this waterway suffers from serious disadvantages. The Murray is navigable for about eight months of the year from the foot of the Eastern Highlands to the sea, a distance of some 1,500 miles, but a bar effectually prevents steamers from leaving the river; the Darling is navigable for 1,200 miles, and the Murrumbidgee for 600 miles. Improvements in the navigation of the Murray are now being made by constructing locks and reservoirs in the lower courses of the river, which will tend to keep up the water-level during the dry season.

Climate. On account of its division into two almost equal parts by the Tropic of Capricorn, and its comparative lowness, Australia has a climate everywhere tropical or sub-tropical. Even in the mountains of the south the winter cold is not excessive, and the extremes of heat and drought are the chief defects of the climate. The mean annual temperature varies from 85° F. in the north to 60° F. in the south. In January, a summer month, only the extreme south-west and south-east coasts have a temperature less than 70° F.; the greater part of the continent is above 80° F.; whilst a large area has a temperature of over 90° F. In July, a winter month, only the northern margins have a temperature greater than 70° F.; the greater part of the continent is between 50° F. and 70° F.; and the south-east is the coolest region. The heart of the continent has a range of temperature exceeding 30° F.

Australia lies in the trade-wind region. The eastern mountains deflect these winds, and receive heavy rains on their eastern slopes; but the winds pass inland as dry winds, and nearly all the land west of the eastern plateau receives little rain. There are two exceptions to this—the zenithal summer rainfall of the north and the winter rainfall in the south, brought by the westerlies. The map of annual rainfall exhibits a rainy band along the north and east coasts and in the south-west, with the rest of the continent very dry. Four climatic provinces may be distinguished: (1) the Northern Coastal Region has always high temperatures (never below 70° F.), and heavy monsoon rainfall in the summer months; (2) the Eastern Coastal Region, south of 20° S. Lat., has an equable temperature, which diminishes on the mean of the year from 70° F. in the north to 60° F. in the south. Rain falls at all seasons, but mostly in summer; (3) the

Southern Region of Victoria and South-West Australia has the "Mediterranean" climate of warm, dry summers and cool, wet winters—the mean annual temperature is 60° F.; (4) the Central Region has a considerable range of temperature, and the rainfall is small.

Vegetation. The influence of the long isolation of Australia from other land masses is seen in its typical plants, which bear a decidedly archaic impress. Tough, leathery leaves, hanging almost vertically, and the secretion of volatile oils, are the devices of Australian plants to resist arid conditions. The eucalyptus, or gum, is the commonest tree, ranging from the dwarf mallee scrub to giants of 400 ft. Along the north the tropical monsoon forests are found. The pandanus tree and mangroves predominate, while olive, brushwood, and cedars grow inland. In the east the wet jungle becomes less important, and passes into open woods, and south of 20° S. Lat. eucalyptus or gum trees, acacias, and mimosas, the typical trees of Australia, begin to predominate. East of the Eastern Divide the woods become more open, and the glades between bigger, until finally the land consists of a rolling savanna, with woods only along the river courses. These savannas, called the Australian Downs, are covered with rich grass, which, however, is burnt up in times of drought. Still farther west, and nearer the desert, the grass becomes scantier, and is found in isolated tufts of spiny spinifex, and finally disappears. Grasslands of the temperate type occur in the basin of the Murray-Darling, and here the native grasses have been improved by the introduction of European grasses, and by the grazing of animals. The dry interior and western areas are either scrublands or deserts. The salt bush, growing round the salt lakes, is relished by sheep, and is one of the few useful plants of the scrub and desert regions. The south and south-west "Mediterranean" areas display evergreens, chiefly shrubs, resinous and waxy, with stiff, sapless leaves, that hang obliquely or parallel to the light. In the south-west, the jarrah and karri, species of eucalyptus, grow to a great height, and yield excellent wood for street-paving and bridges.

Economic Conditions. Australia may be divided into four layers as regards primary production. First, the farmlands along the south and east coasts and the great wheat belts inland; next, the great sheep stations; then the cattle country; and in the extreme north the country of tropical rains. This is a rough distribution, which will become less true as some of the larger holdings are split up. Before anything else, the continent is a paradise of primary production. The main industry is wool production. About one-fifth of the world's useful flocks, producing one-fifth of the world's wool, are found on the downs and the more temperate coastal districts. Droughts are to some extent a menace to the sheep-owner, but their effects are mitigated, where necessary, by the building of storage reservoirs, known as tanks or dams, and the utilization of underground supplies from springs or artesian water-bearing strata. Many of the sheep are of the merino type, ideally adapted to the dry grass plains, but there are also Border Leicesters and many other English breeds and cross-breeds. Dairy cattle are reared chiefly on the rainy valley floors of the highland coastal edges along the east and south. Although dairying has not been firmly established in the

tropical areas of the continent, the industry has developed considerably during recent years in Southern Queensland. In the north and north-west cattle are mainly bred for beef, and promise an important future world source of beef. Frozen mutton and beef are exported, but suffer from the disadvantage of long distance to markets.

Agriculture ranks next to the pastoral industry. The chief cereals are maize in the north and wheat in the south. Wheat is produced in increasing quantities, in spite of the variations in the rainfall. In the tropical region, sugar-cane, tobacco, coffee, cotton, arrowroot, pineapples, and bananas are grown; while in the south, with its dry summer, the grape, fig, orange, lemon, olive, and other Mediterranean fruits flourish, more particularly on the northern slopes of the mountains, and in the irrigated regions of the Riverina. Queensland is confidently expected to become a standard source of cotton, and Tasmania has a world reputation for apples.

The history of Australia is the history of an increasing discovery of mineral wealth. Almost every known mineral of value exists. Gold is found in almost every part, but the annual yield (seventh in world production) is steadily declining. Silver is produced in large quantities in New South Wales (Broken Hill) and in Tasmania (Mt. Lyell). Great hopes are centred in the recently discovered immense silver-lead field at Mt. Isa in Queensland. Copper is mined chiefly in Tasmania and Queensland, and tin, zinc, and lead in many areas. New South Wales and Queensland are at present the chief producers of black coal, but during the last five years the former State produced over 80 per cent of the total for Australia. Victoria possesses very large deposits of brown coal.

Fishing, including the pearl and trochus-shell fishing of the north and north-west, is of comparatively minor importance, though the seas abound in fish of excellent quality. Forestry is growing, and there is an important export of jarrah and karri woods.

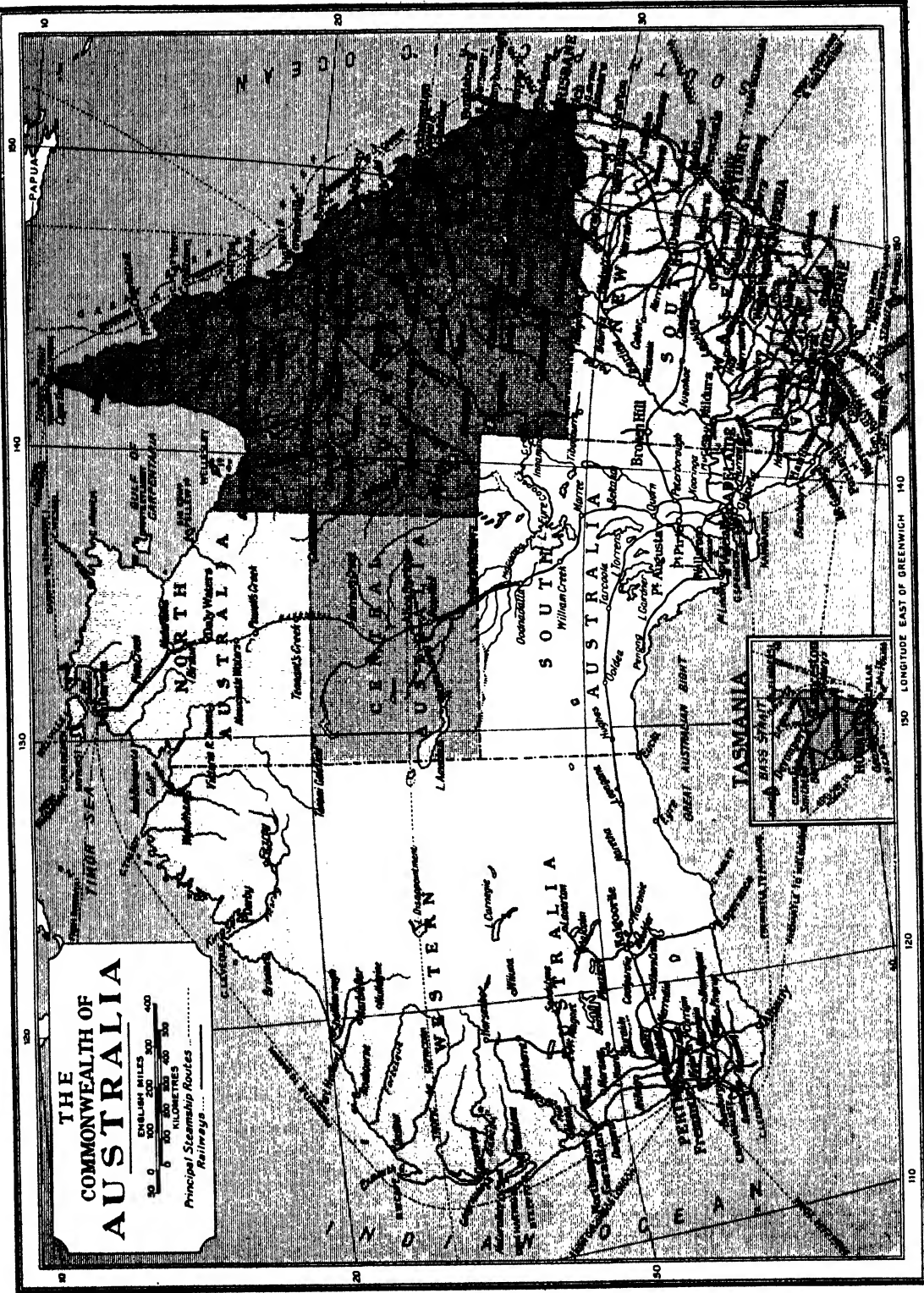
Manufactures have been developed to a great extent, and manufacturers are encouraged by the import duties imposed on almost all goods that can be made in Australia. Much of the industry is concerned with metal works and machinery, clothing and textile fabrics, food and drink; but quantities of other manufactures, such as woollens, paper, motor and other vehicles, are appearing and increasing. The chief manufacturing centres are the State capitals and some of the larger towns.

Air Routes. London has been reached by air from Australia in slightly less than nine days. There are a number of important air lines in operation. That from Perth to Derby (1,467 miles) is the only means of regular communication, except the much slower service by coastal steamer. Other subsidized aerial mail services are Brisbane-Camooweal (1,269 miles), Cloncurry-Normanton (215 miles), Perth-Adelaide (1,453 miles), Derby-Wyndham (600 miles), and Camooweal-Daly Waters (475 miles).

Commerce. Australian trade is chiefly with the United Kingdom, the British Empire, the United States, France, Germany, Japan, Italy, the Dutch East Indies, Belgium, Egypt, Holland, Switzerland, and China. The chief exports are wool, wheat, hides and skins, butter, meat (beef, mutton), flour,

THE COMMONWEALTH OF AUSTRALIA

ENGLISH MILES 0 100 200 300 400
 KILOMETRES 0 100 200 300 400
 Principal Steamship Routes
 Railways



sugar, lead, gold, fruits, milk and cream, tallow, timber, concentrates, zinc, silver, wine, coal, leather, tobacco, pearl shell, cheese, copper, soap, tin, barley, eggs, and sandalwood; and the chief imports are piece goods (cotton, linen, silk, wool), motor-cars and parts, petroleum, machinery (electrical, agricultural, metal-working), iron and steel goods, drugs, chemicals, and fertilizers, bags and sacks, tea, timber, paper, stationery, tobacco, rubber manufactures, yarns, carpets, traction engines, tinned fish, whisky, oils, socks and stockings, hats and caps, glass and glassware, kerosene, trimmings and braid, crockery, and copra.

Political Divisions. The continent is divided politically into five states and two territories, which, with Tasmania, the sixth state, form the Commonwealth of Australia. About 40 miles south-west of Goulburn, N.S.W., a federal district has been marked out in which is Canberra, the capital city of the Commonwealth.

Victoria (87,884 square miles; 1,800,000 population), the most thickly populated of the Australian states, is situated at the south-eastern extremity of the continent. It is the most mountainous state. A tangle of mountains and highlands, filling the eastern part, forms part of the Eastern Highlands, which traverse the colony from west to east at a distance of 50 to 70 miles from the sea. The eastern chains of the Australian Alps are the highest, rising to heights of over 6,000 ft. in Mount Bogong and Feathertop; the Grampians and Pyrenees on the west are lower, descending from 4,000 ft. to 2,000 ft. A large plain, sloping gently towards the Murray, occupies the north-west, and is largely overrun with mallee scrub. The coastal plain, lying to the south of the tableland, is divided into two parts by Port Phillip, and contains two groups of highlands on either side of this inlet, but much of the remaining surface is very level. From the Glenelg River to Port Phillip Bay stretch the volcanic plains, known as the Western District, forming one of the richest pastoral and agricultural tracts of the state. The Yarra, Goulburn, and Murray are the chief rivers.

The climate, generally speaking, is temperate, somewhat warmer and wetter than that of Great Britain, having a mean summer temperature of 65° F., a mean winter temperature of 49° F., a yearly temperature of 57° F., and an annual rainfall of approximately 26 in.

Sheep are reared in all parts, but most of the noted wool clips are produced in the Western District. Much attention is paid to cross-breed sheep. Cattle are reared for their beef and milk, especially on the rich coastal pastures of Gippsland. Dairying is most important, and has proved the salvation of Victorian farming. Wheat, oats, barley, and hay are the chief crops. In the irrigated colony of Mildura, on the Murray, and in the Goulburn and other valleys, excellent "Mediterranean" fruits are grown, dried, and exported. All English fruits (notably apples and pears) are raised on the uplands. The growing of grapes for the production of wine, currants, and raisins is a valuable industry. Beet cultivation is increasing. An important element in the development and prosperity of Victoria was the discovery of gold in 1851, and the state still ranks high as a gold producer, though now exceeded by West Australia. The chief centres are Ballarat, Beechworth, Bendigo, Castlemaine, and Rutherglen.

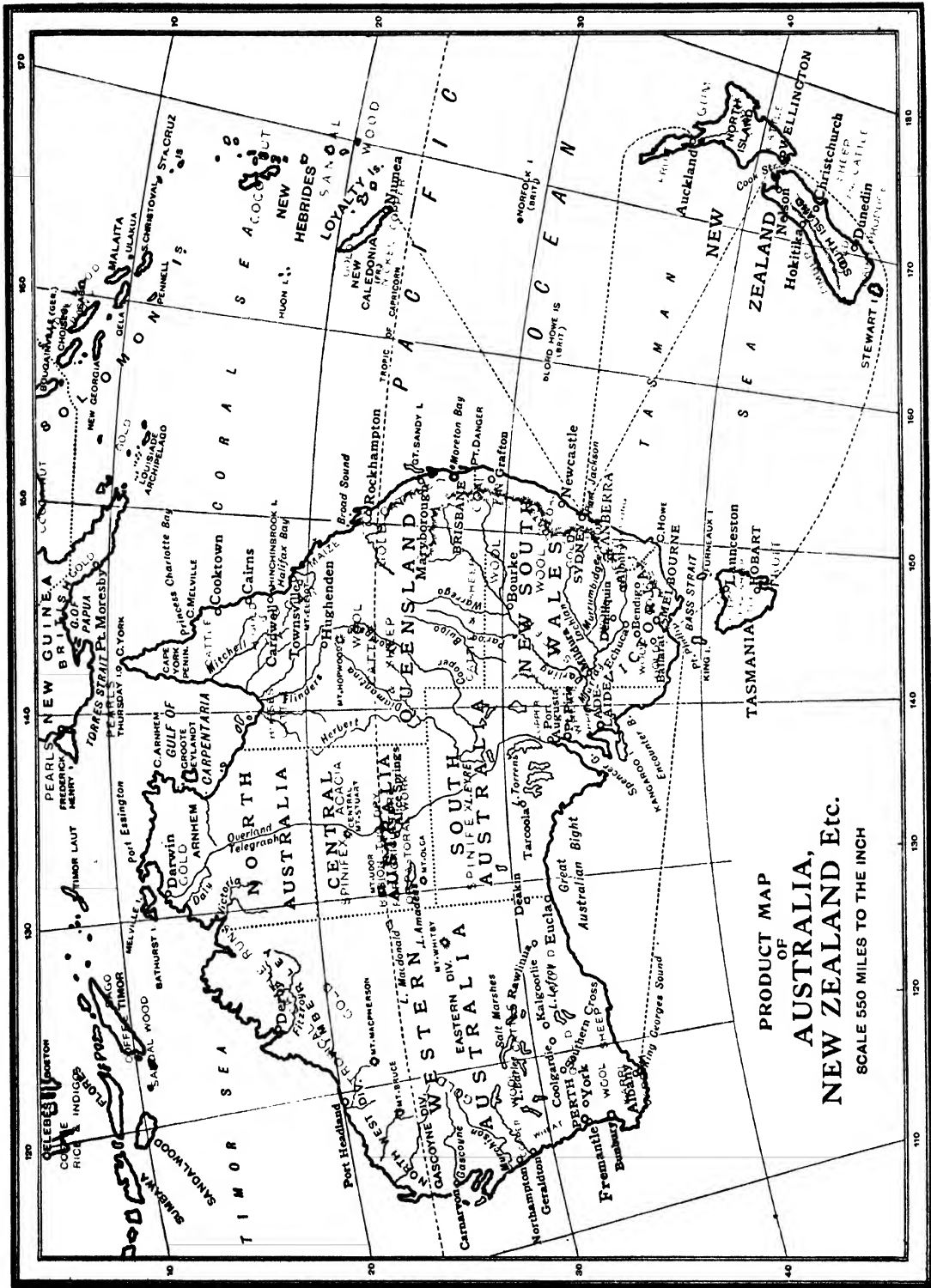
Other minerals occur but are little worked. The extensive brown coal deposits are being used for the production of electricity on a large scale. In manufactures Victoria ranks after New South Wales. The chief manufactures are in connection with food, drink, clothing, paper, leather, metal, wood, motor and other vehicles, and furniture.

The chief overseas exports are gold, wool, live stock, cereals, butter, cream, hides, skins, fruits, and frozen and preserved meat; and the chief overseas imports are textiles, clothing and piece goods, machinery, motor vehicles and accessories, tobacco, drugs, fertilizers, fibres, raw silk, edible nuts, tea, cocoa, rice, sacks, oils, petroleum spirit, paints and varnishes, rubber goods, leather goods, timber, paper, earthenware, glass, furniture, arms, ammunition, and explosives.

The chief towns are: Melbourne (1,033,000), the capital and chief seaport; Geelong (44,000), the second port; Ballarat (42,000), an agricultural and gold-mining centre; and Bendigo (34,000), an agricultural, pastoral, and gold-mining centre.

New South Wales (309,432 square miles; 2,462,421 population), the oldest Australian colony, lies on the eastern side of the continent, between Victoria in the south and Queensland in the north. Running from north to south on its eastern side is a mountainous strip, in which are the New England Range, the Liverpool Range, the Blue Mountains, and the northern part of the Australian Alps with the Kosciusko group (7,328 ft.), the highest in the continent. To the east of these mountains is the coast region, from 30 to 120 miles wide. To the west is a plateau sloping gently to the plains of the Riverina district and the sea. The eastern slope receives copious rainfall (30 in. to 73 in.), but the west is comparatively arid. Sydney has an average monthly temperature of 71° F. in summer and 54° F. in winter; while the western slope has average monthly temperatures varying from 48° F. to 84° F., with occasionally a rise to 130° F. in the shade.

Tens of thousands of acres of land have been opened to pastoralists by the boring of artesian wells and by irrigation from the rivers. Schemes have been undertaken to provide land for the growing of fruit, especially oranges, lemons, peaches, and sultanas. A great dam, erected on the Murrumbidgee at Burrinjuck, irrigates thousands of acres belonging to smallholders. Pastoral pursuits, especially the raising of sheep, have always been the chief occupation. The principal breed of sheep is the merino, but there are also Lincolns, Leicesters, and cross-breeds, reared for their mutton and wool. Dairying is important along the coast. Wheat, hay, green forage, maize, and oats are the chief crops. Gold, silver, silver-lead, zinc, tin, and coal are the most important minerals. During recent years gold has been obtained in the Orange, Copeland, Hill End, and Uralla districts, and from the treatment of the Broken Hill silver-lead ores. There are three main coal-producing areas: the Northern, extending from Newcastle as far inland as Singleton and Muswellbrook, and including Gunnedah in the north-west; the Southern, which embraces the Illawarra, Wollondilly, Mossvale, Berrima, Clyde River, and Sydney districts; and the Western, which comprises the Lithgow, Kandos, Ulan, and Talbragar areas (annual production over 7,000,000 tons). The New England district is the chief tin area. Copper used



PRODUCT MAP
OF
**AUSTRALIA,
NEW ZEALAND ETC.**
SCALE 550 MILES TO THE INCH

to be mined extensively at Cobar, but the yield practically ceased in 1920. The leading manufactures are textiles, metal goods, machinery, motor and other vehicles, furniture, wood working, and the preparation of food and drink.

In both imports and exports New South Wales exceeds all the other states. The chief overseas exports are wool, bullion and specie, lead, tin, coal, butter, wheat, flour, timber, frozen and preserved meat, hides, skins, tallow, and leather; and the chief overseas imports are textiles, apparel, piece goods, yarns and fibres, machinery, motor vehicles and accessories, metal goods, vehicles, copra, tea, spirits, tobacco, paper, stationery, oils, wood, and wicker.

The chief towns are: Sydney (1,254,000), the capital, chief port, and chief naval station; Newcastle (105,000), the second port; Broken Hill (23,500), the centre of the silver-lead mining industry; Lithgow (15,000), Holroyd (14,000); Goulburn (13,000); and Wollongong, Katoomba, and Lismore each with about 10,000.

Queensland (670,500 square miles; 927,092 population), the youngest of the Australian states, occupies the north-eastern portion of the mainland. Its Pacific coast, over a stretch of 15° of latitude, is protected by the natural breakwater of the Great Barrier Reef. Three regions of coast, mountain, and plain make up the build. The narrow coastal plain is separated from the Great Plain of the west by the Eastern Highlands, which are lower and wider than in New South Wales and Victoria. The Coastal Region has a tropical monsoon climate in the north and a temperate in the south (annual rainfall, 40 in. to 140 in.); the Plateau Region has a lesser rainfall and lower temperature; and the Plains Region has a rainfall varying from 40 in. to under 10 in. About 137,000 square miles contain artesian water supplies, and their importance to the pastoral industry can scarcely be overestimated.

On the warm, moist coastland between Bundaberg and Cairns, the sugar-cane is extensively grown. Maize flourishes between Rockhampton and Brisbane. In the north, bananas are grown, pine-apples in the south, and oranges, apples, mangoes, coconuts, lemons, plums, strawberries, apricots, nectarines, and peaches are raised on a commercial scale. Cotton is grown with success in the sub-tropical parts. Sheep are fed on the slopes of the Divide, and on the Great Plains Region. The Darling Downs are noted for their sheep. Large herds of beef cattle are raised in the western and north-western interior. Dairying is carried on to some extent on the coastal strip and on the Darling Downs. Gold is mined chiefly in the Mount Coolon, Gympie, Kilkivan, Glastonbury, Cloncurry, and Batavia River areas (very little is now obtained from the once famous Mount Morgan district); copper at Cloncurry, Gladstone, and Herberton; tin at Herberton, Kangaroo Hills, Chillagoe, Cooktown, and Stanthorpe; and coal in the Ipswich, Bowen, Chillagoe, Clermont, Darling Downs, Rockhampton, Warwick, and Wide Bay areas. Pearl fishing has its centre at Thursday Island.

Wool, frozen beef, butter, tallow, ores, bacon, hams, pork, hides, skins, pearl shell, cheese, sugar, timber, and fruits are the chief exports; and clothing, textiles, drugs, chemicals, metal goods, musical instruments, machinery, motor and other vehicles, oils, paints and colours, tobacco, paper, earthen-

ware, china and glass, bags and sacks, rubber and leather goods, preserved fish, spirits, wood and wicker are the chief imports.

The chief towns are: Brisbane (313,000), the capital and chief port; Townsville (31,000), the second port; Rockhampton (30,000); Ipswich (26,000); and Toowoomba (26,000).

South Australia (380,070 square miles; 580,300 population) is the only Australian state which has a land boundary with each of the other continental divisions. Most of it forms part of the western tableland. The chief mountain ranges are the Flinders Range, running east and north of Spencer Gulf, and the Gawler Range, extending westward across the Eyre Peninsula. North of Spencer Gulf lie the great salt lakes, the largest of which are Eyre, Gairdner, and Torrens. These lakes are expanses of mud encrusted with salt in the dry season, and even in the wet season they are very shallow.

The settled region of the south has a "Mediterranean" climate of hot, dry summers, and cool, rainy winters (rainfall 10 in. to 40 in.); while the central region has a low rainfall, hot summers, warm winters, and great contrasts between the temperatures of day and night. Agriculture is of prime importance. Wheat, the principal crop, is confined to the plains in the settled south. The south-east grows "Mediterranean" fruits, and at Renmark, on the lower Murray, there is an irrigation colony similar to that of Mildura. The state produces three-quarters of the wine of the Commonwealth. Sheep are bred for wool and mutton, and cattle for beef and dairy products. Iron ore from the Iron Knob and salt and gypsum from Cape Yorke peninsula are the chief mineral products. Only very small yields of copper are now obtained from the mines at Burra, Wallaroo, and Moonta.

The chief overseas exports are wool, wheat, flour, skins, frozen meat, silver, lead, copper, zinc concentrates, butter, fruits, tallow, wine, and olive oil; and the chief overseas imports are textiles, tea, iron and steel goods, apparel, bags, sacks, chemicals and fertilizers, machinery, motor vehicles, oils, paper, timber, and rubber goods.

The chief towns are: Adelaide (including Port Adelaide, 325,000), the capital; Port Pirie (9,600), a smelting centre; and Mount Gambier (3,900).

The Northern Territory (523,620 square miles; 4,500 population), under the control of the Federal Government since 1911, is little developed. Part of the country is desert, but much is suitable for pastoral occupation and for agriculture. Darwin is the seat of Government. On 1st March, 1927, the Northern Territory was divided into North Australia (Darwin, capital) and Central Australia (Alice Springs, capital), the dividing line between the two being the twentieth parallel of south latitude.

The Federal Territory (940 square miles; 8,300 population). On 9th May, 1927, the Parliament House at Canberra was officially opened by the Duke of York.

Western Australia (975,920 square miles; 419,800 population), the largest but least densely populated state, includes all that portion of the mainland which extends to the west of the meridian of 129° E. A large portion of it is occupied by a vast arid tableland of very ancient rocks, and coastal plains lie on the north, west, and south. In the north, the

Kimberley district has a tropical monsoon climate (annual rainfall 40 in. to 60 in.); the desert tableland has marked temperature changes and a rainfall varying from 0 in. to 15 in.; and the south-west has a "Mediterranean" climate with a rainfall of 15 in. to 40 in.

Agriculture is the mainstay of the state, and was originally carried on chiefly in the south-west, but much of the interior has been found suitable for wheat growing. Wheat and fruits are grown successfully, and many sheep and cattle are reared. A very valuable asset is the 30,000 square miles of forest, which contain the important jarrah and karri trees. The discovery of gold raised the state from a "Cinderella" to a prosperous condition. The gold belt extends from north to south roughly parallel to the coast, and includes the Kimberley (1886), Pilbarra, Ashburton, Gascoyne, Murchison, and East Murchison (1891), Yilgarn (1887), Mount Margaret, Southern Cross (1887), Coolgardie (1892), Kalgoorlie (1893), and Dundas gold-fields. East Coolgardie is the chief district, but the production from all districts has greatly declined recently. Coal is mined chiefly at Collie. Pearl-fishing has its headquarters at Broome on the north-west coast.

The principal exports are wool, wheat, flour, gold, timber, skins, hides, frozen beef, pearls and pearl shell, and fruit; and the principal imports are foodstuffs, railway plant, machinery, ironware, motor and other vehicles, apparel and attire, earthenware and glassware, wood and wicker manufactures, floor coverings, bags and sacks, paints and colours, leather and rubber goods, chemicals and fertilizers, musical instruments, liquors, tea, sugar, tobacco, oils, and paper.

The chief towns are: Perth (including Fremantle, 205,000), the capital; Boulder (5,400); Kalgoorlie (5,300); Bunbury (5,100); Northam (4,900); and Geraldton (4,800).

Tasmania (26,215 square miles; 215,800 population) is an irregular heart-shaped island, situated at the southern extremity of Australia, from which it is separated by Bass Strait, about 140 miles wide. It is a detached fragment of the highland system of Eastern Australia, a dissected plateau of denudation without coastal sills, and with fractured coastal margins and drowned estuaries. Its climate is healthy, invigorating, and equable, largely owing to its elevation, and its proximity to the sea. The rainfall is abundant in many parts of the state, and droughts are almost unknown. Hobart has an average mean temperature for spring of 52° F., for summer 62° F., for autumn 55° F., and for winter 45° F.

Sheep are the chief animals reared, but the breeding of stud animals—horses, cattle, and sheep—for export is a profitable industry. Dairying is a growing industry. Apples form the staple crop of the districts of Huon and Port Cygnet, and, in the south, small fruits grow to perfection. Tin is mined in the Waratah area at Mount Bischoff, and in the Derby, Branxholm, Gladstone, St. Helens, and Heemskirk areas; gold at Lisle, Mathinna, and Beaconsfield but the main yield is furnished by the silver-lead and copper ores at Rosebery and Mt. Lyell respectively; silver at Magnet, Zeehan, and North Mt. Farrell, but a large proportion is produced by the smelting companies at Rosebery and Dundas; osmiridium principally in the Southern district;

copper at Mt. Lyell and Zeehan; zinc at Rosebery; and coal at Mt. Nicholas, Cornwall, and St. Marys. Tasmania is utilizing its great water power for industrial purposes. Hobart specializes in the fruit industries, and Launceston in the smelting of metals. The oversea exports are wool, zinc, copper, fruit, butter, jam, hops, potatoes, grain, hides and skins; and the oversea imports are textiles and apparel, oils, tea, machinery, drugs and chemicals, paper and stationery, rubber and leather goods, tobacco, hardware, beverages, and provisions.

The chief trade centres are Hobart (58,000), the capital and chief railway centre; and Launceston (31,000), the chief town in the north.

New Guinea, the third largest island in the world, lying between Malaya and Polynesia, is the least explored of all inhabited areas. It has an area of over 300,000 square miles, divided politically into Dutch New Guinea, the whole of the western part of the island (161,000 square miles; 200,000 estimated population); the Territory of Papua (formerly British New Guinea); and the Territory of New Guinea (formerly German New Guinea). The Territory of Papua (placed under the Australian Commonwealth in 1906) comprises the south-eastern portion of the island (90,540 square miles; 275,000 natives; 1,500 whites) with the islands of the D'Entrecasteaux and Louisiade groups and all the islands between 8° and 12° S. Latitude and 141° and 155° E. Longitude. The Mandated Territory of New Guinea includes north-east New Guinea (Kaiser Wilhelm's Land, 70,000 square miles), the Bismarck Archipelago (New Britain, 13,000 square miles; New Ireland, 3,000 square miles; Lavongai, 600 square miles; the Admiralty Islands and North-Western Islands, 1,000 square miles), and Bougainville and Buka, the two northernmost Solomon Islands, respectively 3,200 and 200 square miles. The total native population is estimated roughly at 457,000 and the white population at 2,600.

New Guinea consists of a large compact mass, which is extended by long promontories towards the north-west and south-east. Right across the central mass there runs a main chain of mountains, which is continued on the south-eastern side to the extremity of the island. In Dutch New Guinea peaks exceed 15,000 ft. There are many rivers, few of which are navigable for any considerable distance. The Fly River (620 miles) is the longest. The climate is hot, moist, and unhealthy for Europeans. In the north the rainfall is very heavy; in the south much less.

Agriculture is the most important industry, and gives the greatest promise for the future. Difficulties of labour, capital, and transport are great hindrances; but the system of native plantations is bringing land under cultivation, especially in Papua. Coconuts (copra), rubber, and sisal-hemp are the chief objects of cultivation. Fishing is chiefly concerned with pearls and bêche-de-mer. Gold is important in the Woodlark Island field; copper in the Astrolabe field; coal in several districts of Dutch New Guinea and Papua; and petroleum in Dutch New Guinea, and on the Vailala River in Papua.

The chief exports are trepang, copra, pearls, pearl-shells, gold, sandalwood, rubber, sisal-hemp, and coffee; and the chief imports are agricultural products and groceries, drapery, machinery, tobacco, oils, beverages, and drugs.

As yet New Guinea possesses no real towns in the European sense of the word. Port Moresby (700 whites) is the capital and chief port of Papua; Rabaul (1,500) is the capital of the Mandated Territory; and Fakfak, Manokwari, and Merauke are the chief settlements in Dutch New Guinea.

The Commonwealth has also under its authority Norfolk Island, and (administered in conjunction with the British and New Zealand Governments) Nauru Island.

The Fiji Islands (7,083 square miles; 183,000 population), lying some 1,000 miles north of New Zealand, are a British possession. Viti Levu (4,053 square miles) and Vanua Levu (2,130 square miles) are the largest islands. The climate, though tropical,

is equable and remarkably healthy for Europeans. Sugar is the main product (normal annual output, 85,000 tons). The chief exports are sugar, copra, molasses, trocus shell, rubber, cotton, bananas, maize, and hides. Clothing and drapery, bags, sacks, socks, oils, spirits, motor vehicles, hardware, fish, timber, coal, flour, rice, meat, metal goods and machinery are imported. Suva (1,741 whites), the capital, and Levuka are the chief trade centres.

Mails and Time. Mails are dispatched from Great Britain to all parts of Australia every Friday night. The time of transit to the chief towns varies from 26 to 35 days.

The time in West Australia is 8 hours, in South Australia $9\frac{1}{2}$ hours, and in other parts of Australia 10 hours in advance of Greenwich time.

Position, Area, and Population. The Dominion of New Zealand, the Long White Cloud, is an archipelago with an area of 104,015 square miles, lying about 1,200 miles east-south-east of Australia, and nearly in the centre of the water hemisphere. Two large islands, the North Island (44,281 square miles) and the South Island (58,092 square miles), make up the greater part of the Dominion. The remainder of the Dominion is largely made up of Stewart Island (670 square miles), the Chatham Islands (372 square miles), the Kermadec Islands, and the Cook Archipelago. The population, almost exclusively British, is 1,516,000. There are also 69,000 Maoris, who are increasing in number.

Coast Line. New Zealand is a narrow, sea-girt land, with deep bays and steep peninsulas. No place is more than 75 miles from the sea, and hence, except when partly negatived by unfavourable location of harbours and difficulties of terrain, there are advantages in freight rates to the coast. In most places the coast is high, and sometimes grandly precipitous. Sea inlets are numerous, but the harbour accommodation is, unfortunately, not too conveniently distributed. In the extreme south-west of the South Island many fiords penetrate the land, and rival those of Norway in their scenery; but give access to no fertile interior. On the west coasts there are no really good harbours, but many bar harbours. Good harbours are found at Waitemata, and Port Nicholson on Cook Strait. The eastern coast of the South Island provides little natural shelter. Lyttelton has had its harbour made more commodious by artificial means. Wellington, Auckland, Lyttelton, Dunedin, Invercargill (Bluff), Napier, New Plymouth, Timaru, Wanganui, and Gisborne are the chief ports.

Relief. The surface of the two main islands is essentially mountainous, and the chief mountain ranges have a general north-east to south-west direction. The Southern Alps of the South Island, lying close to the western coast, are lofty (Mt. Cook, 12,350 ft.), and covered with perpetual snow, while the glaciers on them, notably the Tasman, Franz Joseph, and Fox, are world-famed. These mountains are a barrier to communication between the east and west, and act as rain condensers. There are few routes over them; one of the most famous is that through the Otira Gorge and over Arthur's Pass. Rail communication between Greymouth and Christchurch is by the famous Otira tunnel (5½ miles). The mountains of the South Island are continued in those lying on the east side of the North Island, which are called the Tararua, Ruahine, and Raukumara ranges. They are of much less average height than the Southern Alps. Lofty peaks, all of volcanic origin, lie westward of these ranges, and include Mount Egmont (8,260 ft.), Ruapehu (9,175 ft.), and Tongariro (7,515 ft.). The North Island is still subject to volcanic disturbances. In the volcanic tableland of the centre lies Lake Taupo, the largest lake of the Dominion. Otago is an old plateau lying almost at right angles to the Southern Alps. The Canterbury Plains, occupying the middle of the South Island on its eastern side, extend over 100 miles from north to south and from the sea inland for about 40 miles. They form the chief lowland area of New Zealand, but many other lowland areas occur, the chief of which are in Southland, in the district round Hawke's Bay, in the Manawatu,

and in the North Island the Wairarapa Plain of the south. There are numerous and beautiful lakes, and many rivers, none of which is of much commercial importance. The Waikato, the longest flows northward through Lake Taupo, and is navigable for small steamers for about 50 miles; while the Clutha, the greatest in volume, enables small river steamers to ascend only 30 miles.

Climate. The climate is greatly modified by the small size of the islands and the free exposure to oceanic influences. Summers are not excessively hot, nor the winters cold. The range of temperature is very small (Auckland, 65·6° F. in January, 51·8° F. in July; Christchurch, 61·2° F. and 42·7° F.). Westerly winds bring the most rain, and hence the heavy rainfall on the western slopes of the Southern Alps (80 in. to 100 in.) and the small rainfall of the Canterbury Plains (less than 30 in.). The North Island has an average rainfall of about 50 in., the South Island somewhat less. New Zealand has a high percentage of bright sunshine, even rivalling Italy; this is a factor of prime importance in the production of excellent fruits and the finest quality in cereals.

Production and Industries. *The Pastoral Industry* is of prime importance, and for this New Zealand possesses great advantages in its fertile soils, sufficient rainfall, and mild winters. Sown grasses are grown almost everywhere, and about 90 per cent of the cultivated land is under artificial grasses. Sheep-rearing is largely carried on in the land districts of Wellington, Canterbury, Otago, Hawke's Bay, Gisborne, and Southland. Over 30,000,000 sheep are reared, cross-breeds and other long-wools predominating on account of their suitability for the frozen meat trade. Cattle are bred to the number of about 3,800,000; the North Island has over three-quarters of the total, the chief districts being Auckland, Wellington, and Taranaki. Canterbury has the most in the South Island. The expansion of dairying in recent years has reached remarkable levels, and butter and cheese rank among the principal exports. The Danish factory and co-operative system has been adopted. Auckland, Taranaki, and Wellington produce much butter, and Taranaki and Otago make excellent cheese. Horses (300,000) are reared chiefly in Canterbury, Auckland, Wellington, and Otago. Pigs number 560,000, and there are 3,800,000 poultry.

Agriculture. The chief crops are wheat, oats, potatoes, root crops, and fruits. Eighty per cent of the acreage under wheat is in the province of Canterbury. Canterbury, Otago, and Southland are the chief oat-growing provinces. Fruit is grown in the north of the North Island, but the chief export is from the South Island. New Zealand flax or phormium occupies a large area of the swamp lands; its leaves, sometimes 10 ft. long, provide fibres which are used in the production of cordage, rope, and twine. Only one-eighth of New Zealand is considered to be permanently unproductive.

Forestry. Millions of acres, especially on the mountain ranges of the west of both islands, and in the centre of the North Island, are still clothed with dense forests. The outstanding timbers for commercial use are rimu (red pine; 60 per cent of the cut), kahikatea (white pine, used for butter-boxes, 20 per cent), matai (black pine), kauri, totara, and beech. The kauri pine grows only in the Auckland

province north of 39° S. Lat. Besides valuable timber, the kauri supplies an amber-like gum, which is largely used in making varnishes. Kauri gum is found in large masses at the foot of the trees, or in the ground cleared of kauri forests. State afforestation, dating from 1896, has planted over 250,000 acres in trees, and private afforestation companies have planted a further 150,000 acres. In both cases the acreage increases annually.

Fishing. For the length of its coastline New Zealand is not plentifully supplied with fishing grounds, as the depth of water is mostly too great. The value of the fishing catch is estimated at about £500,000 per annum, of which about £100,000 is exported. Whale fishing is almost extinct (£10,000 to £15,000 per annum). The chief food fishes are snapper, hapuku, cod, flounder, gurnard, and whitebait. Auckland, Wellington, Lyttelton, Dunedin, Napier, and Bluff are the chief fishing centres.

Mining. The mineral resources are exceedingly varied, but with the exception of iron ore are not large. Quartz and alluvial mining for gold are carried on. Over 80 per cent is derived from quartz mines, Auckland and the west coast of the South Island being the chief centres. Coal to the extent of about 2,500,000 tons is raised annually. Half of it comes from the Westport and Greymouth districts of the South Island. In the North Island the Taupiri district is important. Iron-ore is smelted from the limonite deposits at Onakaka, Nelson. Silver is produced only by refinement of bullion at the gold quartz mines.

Manufactures. Manufacturers have developed a great deal in recent years. Butter, cheese, and meat industries have an output of over £40,000,000 annually, while the value of the products of all factories is almost £100,000,000 annually. There is very little marked specialization of industries in localities, the industries of the large towns tending to be much the same as each other. The chief industries are: animal food; vegetable food; heat, light, and power; furniture and woodwork generally; printing and publishing; clothing; metal-working; carriages and vehicles; and brewing and bottling.

Communications. Roads are good, and have been vastly improved recently. Two roads cross the Southern Alps, one from Hokitika through the Otira Gorge to Christchurch, and the second from Westport to Nelson and Blenheim. The opening of the Otira Tunnel (5½ miles) through the Southern Alps in 1923 allows direct rail communication between Christchurch, Greymouth, and Hokitika. There are 3,287 miles of state-owned railway and 116 miles of privately-owned railway. The main railway of the North Island runs from Wellington through Ohakune, Taumarunui, Hamilton, and Auckland to Russell; and branch lines go to Napier, New

Plymouth, Rotorua (tourist traffic), Thames, Waihi, and the Bay of Plenty. Short lines run inland in other places. In the South Island the main line runs from Invercargill through Dunedin, Oamaru, Timane, to Christchurch and Lyttelton; it has numerous branches to north and west. There are short lines from Picton, Nelson, and Westport. Coastwise traffic is important and counterbalances to some extent the disadvantages of the disconnected railways. Steamship services with Europe, America, and the East are good, and there is a Dominion Air Force.

Commerce. The principal exports are: Wool, butter and cheese, frozen meat, tallow, hides and skins, sausage-casings, fruit, gold, and timber. The principal imports are: Textiles, clothing, motor-vehicles, machinery, metalware, oils, tobacco, tea, sugar, and alcoholic beverages. New Zealand's external trade is higher, in proportion to population, than that of any other country in the world. Approximately two-thirds of the total trade is with the United Kingdom, the remainder being chiefly with the United States, Canada, Australia, France, Germany, Belgium, Japan, India, and Ceylon.

Trade Centres. The chief towns are: Auckland (217,000), the chief commercial centre; Wellington (143,000), the political capital; Christchurch (127,300), the trade centre for the Canterbury Plains; Dunedin (86,500), the capital of Otago; Wanganui (27,850); Invercargill (24,000); Palmerston North (22,800); Napier (19,300); Timaru (18,350); New Plymouth (18,200); Hamilton (18,100); Hastings (16,750); Gisborne (16,250); and Nelson (12,500).

Dependencies. The dependencies of New Zealand are not of much commercial importance. They include the Three Kings Islands, the Auckland Islands, Campbell Island, the Antipodes Islands, the Bounty Islands, the Kermadec Islands, the Cook Islands, Western Samoa (mandate), Nauru Island (mandate, British, Australian, and New Zealand), and the Ross Dependency. The Chatham Islands have the status of a New Zealand county, and are classed administratively as part of New Zealand.

There is a Pacific cable from Auckland to Vancouver, and both Auckland and Wellington are connected by cable direct with Sydney. Mails are dispatched every Friday *via* Suez, every four weeks *via* San Francisco and the United States, and every four weeks *via* Vancouver and Canada. The time of transit is about 30 days by the American routes and 35 days *via* Suez. Radio communication has been established since 1911, and there are twenty-one Government stations now operating.

It will be noticed that the longitude of Wellington is about 175° east. The standard time recognized throughout the Dominion is 11½ hours in advance of Greenwich time.

NEW ZEALAND

20 0 20 40 60 80 100 120
ENGLISH MILES

Railways Steamship Routes

REFERENCE TO COUNTIES IN NEW ZEALAND

NORTH ISLAND

- | | | |
|--------------------|--------------|-------------|
| 1 MANHOUTI | 29 WHANGAREI | 51 HANGANUI |
| 2 WHANGAREI | 30 OPOTI | 52 HANGAREI |
| 3 HOKIANGA | 31 MATARAHA | 53 HANGAREI |
| 4 BAY OF ISLANDS | 32 HANGAREI | 54 HANGAREI |
| 5 HANGAREI | 33 HANGAREI | 55 HANGAREI |
| 6 HOBSON | 34 HANGAREI | 56 HANGAREI |
| 7 OTANATEA | 35 HANGAREI | 57 HANGAREI |
| 8 RODNEY | 36 HANGAREI | 58 HANGAREI |
| 9 WAITANZ | 37 HANGAREI | 59 HANGAREI |
| 10 EDEM | 38 HANGAREI | 60 HANGAREI |
| 11 MANUKAU | 39 HANGAREI | 61 HANGAREI |
| 12 FRANKLIN | 40 HANGAREI | 62 HANGAREI |
| 13 COROMANDEL | 41 HANGAREI | 63 HANGAREI |
| 14 THAMES | 42 HANGAREI | 64 HANGAREI |
| 15 HANGAREI PLAINS | 43 HANGAREI | 65 HANGAREI |
| 16 CHURCHILL | 44 HANGAREI | 66 HANGAREI |
| 17 RAGLAN | 45 HANGAREI | 67 HANGAREI |
| 18 WAIKATO | 46 HANGAREI | 68 HANGAREI |
| 19 PIRARUA | 47 HANGAREI | 69 HANGAREI |
| 20 TAURANGA | 48 HANGAREI | 70 HANGAREI |
| 21 HANGAREI | 49 HANGAREI | 71 HANGAREI |
| 22 HANGAREI | 50 HANGAREI | 72 HANGAREI |
| 23 OTOROHANGA | 51 HANGAREI | 73 HANGAREI |
| 24 HANGAREI | 52 HANGAREI | 74 HANGAREI |
| 25 HANGAREI | 53 HANGAREI | 75 HANGAREI |

SOUTH ISLAND

- | | | |
|---------------|-------------|--------------|
| 1 COLLINGWOOD | 18 OXFORD | 55 MACKENZIE |
| 2 TARARA | 19 ASHLEY | 56 LEVELS |
| 3 BULLER | 20 POMAI | 57 HANGAREI |
| 4 WAIMEA | 21 HANGAREI | 58 HANGAREI |
| 5 SOUNDS | 22 LYRE | 59 HANGAREI |
| 6 HANGAREI | 23 HANGAREI | 60 HANGAREI |
| 7 HANGAREI | 24 HANGAREI | 61 HANGAREI |
| 8 HANGAREI | 25 HANGAREI | 62 HANGAREI |
| 9 HANGAREI | 26 HANGAREI | 63 HANGAREI |
| 10 GREY | 27 HANGAREI | 64 HANGAREI |
| 11 HANGAREI | 28 HANGAREI | 65 HANGAREI |
| 12 HANGAREI | 29 HANGAREI | 66 HANGAREI |
| 13 HANGAREI | 30 HANGAREI | 67 HANGAREI |
| 14 HANGAREI | 31 HANGAREI | 68 HANGAREI |
| 15 HANGAREI | 32 HANGAREI | 69 HANGAREI |
| 16 HANGAREI | 33 HANGAREI | 70 HANGAREI |
| 17 HANGAREI | 34 HANGAREI | 71 HANGAREI |
| 18 HANGAREI | 35 HANGAREI | 72 HANGAREI |
| 19 HANGAREI | 36 HANGAREI | 73 HANGAREI |
| 20 HANGAREI | 37 HANGAREI | 74 HANGAREI |
| 21 HANGAREI | 38 HANGAREI | 75 HANGAREI |

NORTH ISLAND

NEW ZEALAND

SOUTH ISLAND

TASMAN SEA

PACIFIC OCEAN

CHRISTCHURCH

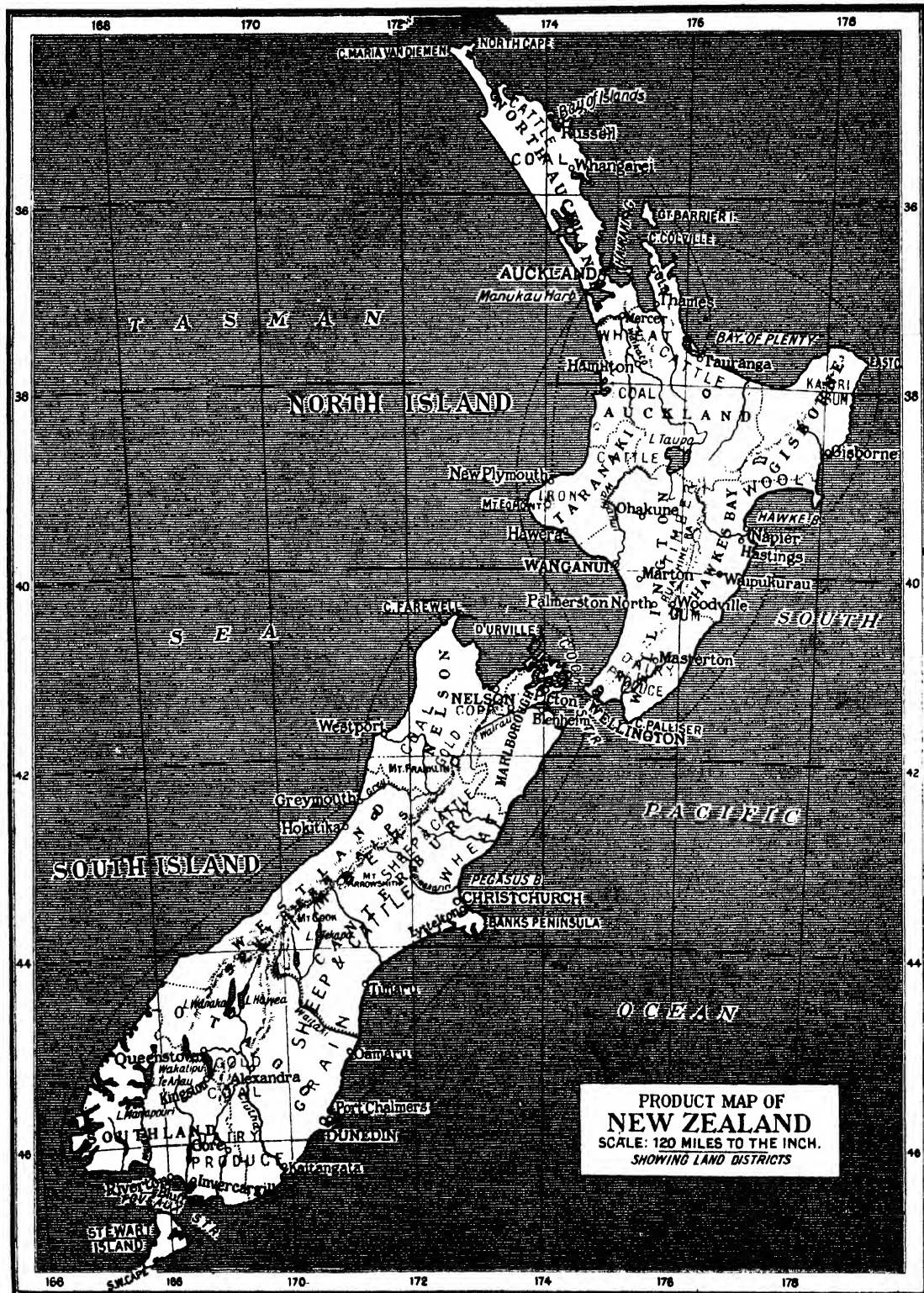
TIMARU

WELLINGTON

PROVINCIAL DISTRICTS

- | | | |
|----------------|----------------|-------------------------|
| I Auckland | IV Wellington | VII Canterbury |
| II Hawke's Bay | V Nelson | VIII Westland |
| III Taranaki | VI Marlborough | IX Otago with Southland |

Boundaries shown thus



PRODUCT MAP OF
NEW ZEALAND
SCALE: 120 MILES TO THE INCH.
SHOWING LAND DISTRICTS

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